

Khyber Journal of Public Policy



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Khyber Journal of Public Policy (KJPP)

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The journal's focus on original research papers, reflective studies, and analyses related to international relations, Pakistan affairs, and faith & society reflects a commitment to addressing critical issues and proposing viable solutions to these issues. By bringing together researchers, experts, and policy practitioners, the journal provides a platform for a diverse range of perspectives and experiences, allowing for a more comprehensive and nuanced understanding of complex issues.

The focus on public policy further underscores the journal's commitment to making a tangible impact on national and international issues. By providing a space for research and analysis, the journal helps to inform policymakers and practitioners, who can then use this information to develop more effective policies and programs. Additionally, the focus on viable solutions emphasizes the importance of actionable recommendations that can be implemented in the real world.

Overall, the journal's focus on research, analysis, and practical solutions reflects a commitment to advancing knowledge and making a positive impact in the fields of international relations, Pakistan affairs, and faith & society. By providing a platform for diverse perspectives and experiences, the journal contributes to a more comprehensive understanding of complex issues and the development of effective policies and programs.

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Feedback and Information:

Editor, *Khyber Journal of Public Policy* , National Institute of Public Administration, Peshawar Pakistan. Email. muqem@nim.gov.pk, muqemz@gmail.com

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- Manuscript should be ideally around 5000 words;
- An abstract of about 150 words should be included;
- Five to six keywords should be provided;
- American English should be used;
- APA Manual of Style should be followed for Endnotes. In-text citations and bibliography are not required.;
- All the tables, charts, graphs and figures included in the manuscript should be in an editable, MS Word form.

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Message of the Capt. (Retd) Usman Gul,

*Director General National Institute of Public Administration, Peshawar
on the eve of Inaugural Issue of the Khyber Journal of Public Policy:*

I am delighted to announce the inaugural issue of the Khyber Journal of Public Policy, an initiative led by Dr. Muqem, Chief Instructor of NIPA Peshawar and supported by Dr. Ijaz Munir, Rector NSPP. The journal covers social science and related concepts to significant political, economic, and social issues, exploring the ways in which public policies are made. Its articles deal with topics of concern to public policy scholars and practitioners alike, often cutting across disciplines such as environmental issues, international political economy, international relations, regulatory policy, and other critical issues facing Pakistan.

The Khyber Journal of Public Policy has been developed to provide a platform for policy researchers, academics, and practitioners to share their insights and solutions to critical challenges faced by the nation.

As Director General of the National Institute of Public Administration Peshawar, I am proud to support this initiative and congratulate Dr. Muqem and his team for their efforts in bringing this journal to fruition. I encourage all concerned to contribute to the journal and engage in the ongoing dialogue surrounding public policy issues. With the support of esteemed researchers and practitioners, I am confident that the Khyber Journal of Public Policy will become a leading resource in the field.

Thank you and congratulations once again on this milestone achievement

Capt. (Retd) Usman Gul,
Director General
National Institute of Public
Administration, Peshawar

Preface

of the Special Issue of Khyber Journal of Public Policy

We are pleased to present the first issue of the Khyber Journal of Public Policy (KJPP), a publication of the National Institute of Public Administration (NIPA), National School of Public Policy (NSPP), Peshawar. The KJPP is a valuable addition to the existing publications on public policy, serving as a platform for dissemination of policy research outcomes by the officers who have undergone the intensive training courses at NSPP.

The mid-career and senior level officers from various organs of the government undertake these courses, focusing on all aspects of public policy, including the critical analysis of policy design, implementation, and impact. The officers' research outcomes propose viable solutions to the pressing issues faced by the country, and are thus of great value to practitioners, professionals, and academicians.

The KJPP aims to fulfill the intent of its act by providing a forum for disseminating these precious outcomes as a ready reference for practitioners and academia in the field of public policy. The journal follows the prescribed procedure of printing and publishing, as described by the Higher Education Commission (HEC), and we are confident that it will soon receive recognition from HEC and other concerned international agencies.

We extend our sincere gratitude to the authors who have contributed their research outcomes for the first issue of the KJPP. We hope that the KJPP will serve as an excellent source of knowledge and insights for public policy practitioners and academicians, enabling them to adopt and implement the policy recommendations and novel solutions to the crucial problems faced by the nation.

Dr. Muqem Islam Soharwardy
PhD(Public Policy & Governance)
Editor ,
Khyber Journal of Public Policy

In this Issue

In the first paper author focuses on environmental issues of the Hind-o-Kush region. Hindu Kush Himalaya (HKH) provides essential resources and services to millions of people living downstream, but is being affected by unplanned land management, urbanization, and climate change. The buying and selling of land plays a significant role in land use patterns, which in turn affects the environment. To address these issues, the research suggests adopting a comprehensive approach to sustainable development projects in mountain regions of Gilgit Baltistan, with community participation. The study used a cause-and-effect method, analyzing available data to conclude that implementing a systematic land use policy can ensure sustainable development.

The second paper reviews the preferential trade agreement between turkey and Pakistan. Pakistan and Turkey have signed a Preferential Trade Agreement (PTA), strengthening their political and economic relations. The agreement is expected to have a positive impact on bilateral trade and domestic economic situation in both countries. However, potential issues and challenges need to be addressed, and recommendations have been made for optimizing the benefits of the PTA. The agreement reflects the cultural, religious, and historical ties between the two nations.

Third article highlights the emergence of digital diplomacy as an effective tool for diplomacy, with Pakistan's Ministry of Foreign Affairs recently incorporating it into its core functions. It covers the academic dimension of digital diplomacy and its integration with other tools by leading countries. The article also identifies the issues and challenges faced by Pakistan and makes recommendations to optimize the use of digital diplomacy.

Fourth study analyzes the factors responsible for Pakistan's dependence on imported edible oil, which has reached 92%. The lack of promotion of oilseed crops, liberal import policies, stagnant custom duties, and competition with major crops are among the factors. The study finds that minor crops like sunflower and canola are more profitable than major crops. India's vibrant import duties have helped protect local growers and meet 35% of their edible oil requirement from local production. Pakistan needs to encourage local production of oilseed crops to reduce dependence on imported oil, which is a serious threat to public health.

Fifth research paper focuses on the export of skilled, semi-skilled, and unskilled labor as a way for developing countries like Pakistan to address chronic problems like overpopulation, unemployment, low per capita income, and poverty. The study highlights the multifaceted market for labor exports and the contribution of foreign remittances to the growth of foreign reserves, which amounted to 31.2 billion USD in 2022. However, the research also identifies the challenges faced by Pakistan in the recruitment, placement, and exploitation of emigrants, as well as the smuggling of aspiring emigrants. The study aims to propose solutions to the gaps and weaknesses in the regulatory framework that give rise to illegalities and irregularities in the emigration structure, which could create distrust among overseas Pakistanis.

Last research paper of this issue highlights the challenges faced by Pakistan in addressing cybercrimes and the shortcomings of the Prevention of Electronic Crimes Act (PECA), 2016. The author argues that Pakistan needs to shift its policy orientation from being security-centric to citizen-centric, make amendments to PECA, and invest in capacity building of citizens and state agencies to effectively combat cybercrimes. The research emphasizes the need for a social contract between the state and citizens in the cyberworld, and the importance of indigenization of IT applications for socioeconomic empowerment. The author suggests that the state needs to exercise adequate control in the cyberworld while respecting digital rights.

Unraveling Harassment: An In-depth Exploration and Mitigation Strategies in KP Universities

Abdul Kabir¹

Mr. Jehanzeb Khan²

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Abstract:

Higher education is essential for human capital development and socio-economic growth. However, rising harassment cases in Khyber Pakhtunkhwa universities, particularly involving male teachers exploiting female students, are alarming. Despite global recognition of harassment as a civil rights violation since the 1970s, research in Pakistan remains limited. Effective solutions require anti-harassment training, improved reporting systems, and cultural shifts. Key recommendations include leadership commitment, policy monitoring, HR-student collaboration, third-party involvement, and linking complaint platforms to the ombudsman. Curriculum changes and continuous education are also necessary to foster safer, more inclusive university environments.

Key words:

Higher Education, Harassment, Power Dynamics, Khyber Pakhtunkhwa, Cultural Change

¹ Currently posted as Deputy Secretary, Higher Education Department, Government of Khyber Pakhtunkhwa, Peshawar

² Faculty Advisor

Introduction

Higher education plays a crucial part in developing human capital and fostering the socio-economic and sustainable growth of a nation. Unfortunately, recent years have seen a rise in cases of harassment within universities, causing serious concerns for students and their families. This misconduct often involves individuals in positions of power, such as teachers, students, and peers, leading to situations where the harasser can intimidate and mistreat the victim, particularly in teacher-student relationships. Male teachers taking advantage of female students under the guise of academic projects is a common occurrence.

Educational institutions are meant to be safe environments for students, yet the prevalence of harassment cases reported in various universities in Khyber Pakhtunkhwa highlights the issue, with sex-for-grades being a particularly widespread form of harassment. Globally, the concept of harassment was legally recognized in the US in the 1970s as a violation of civil rights, barring discrimination based on sex, race, religion, and national origin. The fight against harassment has since gained momentum, with women advocating for equal and secure spaces for all. Central to feminist activism is the acknowledgment that harassment is intertwined with power dynamics, perpetuating discrimination, privilege, and inequality. It is crucial to consider the intersectionality of race, class, and sexual harassment in this context.

Harassment is a prevalent issue in Pakistan, with children, youth, and women being particularly vulnerable to such misconduct. However, research on this topic in Pakistan remains limited, underscoring the importance of further exploration in this area. Youth are often targets of harassment, yet there is a lack of comprehensive studies focusing on universities specifically. This underscores the necessity of delving deeper into this subject, making it a pertinent choice for research endeavors.

Problem Statement

Recently, cases of harassment have surfaced in various universities of Khyber Pakhtunkhwa, creating havoc in society. Harassment is ingrained

in higher education, where students, faculty, and officials are all affected by it. Preventing harassment from occurring is far preferable to remedying its consequences. We need to take a proactive approach against systematic harassment. It is imperative to analyze the factors responsible for it and identify the gaps in policies and practices for mitigating this unwanted and unfavorable harassment in universities across the province.

Scope of the Study

This study focuses on the prevalent situation of harassment in universities of KP, its causes, and its effects on education and individuals. It also examines the legal framework and redressal mechanisms and their effectiveness. The study will critically analyze the existing policies and strategies and suggest pragmatic approaches for mitigating harassment in universities of KP.

Literature Review

Harassment research originated in the 1970s in Scandinavian countries, gaining significant attention in 1982 after three boys aged 10-14 from Norway attempted suicide due to harassment. This tragic event prompted a nationwide campaign in Norwegian schools to address and combat the issue effectively (Olweus, 1993). Similarly, Japan, the Netherlands, the United States, the United Kingdom, and Australia saw an increase in research funding and public awareness regarding harassment in the late 1980s and early 1990s.

The definition of harassment has been approached in various ways. Olweus (1996) illustrates harassment as repeated negative actions towards a victimized student by their peers, emphasizing the power imbalance between the victim and the harasser based on status, size, and strength.

Research by Reed et al. (2019) revealed that 32% of students aged 12-18 reported experiencing harassment in the previous academic year. An analysis by Iranzo, Buelga, Cava, and Ortega-Baron (2019) indicated a high occurrence rate of harassment among youth, approximately 35%. Furthermore, studies have shown that most harassment incidents happen inside educational institutions, including schools, colleges, and universities, with cyber harassment often perpetrated by students' peers

(Gaffney, Farrington, & Ttofi, 2019).

The impact of harassment extends beyond physical and psychological health, affecting academic performance, class attendance, and even leading to students' withdrawal from educational settings (Gaffney, Farrington, & Ttofi, 2019).

Cognizant of the available research on this subject, it can be inferred that while substantial research has been conducted in this area, it is still in its initial stages in the Pakistani context. Therefore, it is crucial to document cases of traditional and cyber harassment faced by university students and examine the effects of these experiences on their academic performance and potential substance exploitation.

Methodology of the Study

1. Study is mostly based on qualitative secondary Data.
2. Some primary Data (university students) has also been used.
3. Analytical tools used include situational analysis, legal/institutional analysis, gap analysis, and cause and effect analysis.

What is Harassment

The Human Rights Act defines harassment as a “*course of vexatious comment or conduct that is known or ought reasonably to be known to be unwelcome.*” Harassment is a type of discrimination that occurs when an individual is subjected to unwelcome, offensive, or humiliating comments or actions. It is essential that there is a connection between the harassing behavior and the individual's protected characteristics, known as prohibited grounds. Typically, harassment involves a pattern of behavior over time, although isolated incidents can also be considered harassment. **OR** Harassment and discrimination encompass any unwelcome remarks or critical behaviors based on religion, gender, family or marital status, race, age, place of origin, political belief, disability, individual characteristics, performance, place, training, social skills, benefits allocation, reward, job duties, and training. Such behavior creates a hostile, aggressive, or offensive work environment. The severity of harassment can vary from minor incidents to more severe cases. It is important to note that the absence of complaints does not necessarily

indicate a workplace free from harassment or discrimination.

Harassment and discrimination refer to unwelcome remarks or critical behaviors targeting religion, gender, family or marital status, race, age, place of origin, political belief, ancestry, disability, personal characteristics, performance, position, training, social skills, benefits allocation, compensation, job duties, and training. These actions contribute to a threatening, aggressive, or offensive work environment. The level of harassment can range from less severe incidents to more serious cases. It is crucial to understand that the lack of complaints does not guarantee a harassment-free or discrimination-free workplace.

Harassment refers to persistent and regular unwanted actions directed towards a victim by either an individual or a group of individuals. These actions can range from making racial slurs to making annoying or malicious comments, but they must occur repeatedly to be considered harassment. Harassment is against the law, and a victim has the right to seek a restraining order against the person responsible. Sexual harassment encompasses three distinct types of behavior:

1. Gender harassment, which involves displaying sexist anger and engaging in crude behavior.
2. Uninvited sexual attention, which includes unwelcome oral or physical sexual advances.
3. Sexual coercion, which occurs when someone conditions favorable treatment in a professional or educational setting on engaging in sexual activity.

Types of harassment

Although many people think of sexual harassment when they hear the term, sexual harassment is just one form of harassing behavior. Harassment often occurs as a result of discrimination based on a variety of attributes, including gender identity, sexual orientation, religion, and race. Types of harassment that may occur in the workplace and in other situations include the following.

1. Discriminatory harassment occurs when a harasser resorts to physical or non-physical abuse towards another individual simply because they are perceived as different.
2. Harassment based on religion involves making jokes or comments about

- a victim's religion.
3. Power harassment arises from a significant power difference between the victim and the offender. The harasser uses their position to coerce the victim into unwanted acts.
 4. Psychological harassment involves offenders engaging in various behaviors such as spreading false reports about the victim, making threatening gestures, forcing the victim to perform unwanted tasks, and interfering with their private lives through persistent irritation.
 5. Sexual harassment occurs when the offender makes repeated sexual advances towards the victim despite knowing they are unwelcome, as evidenced by the victim's clear discomfort.
 6. Online harassment involves victimizing individuals through the internet using tactics such as blackmail.

Historical Background

Harassment research originated in the 1970s in Scandinavian countries. However, in 1982, the issue gained significant attention when three boys aged 10-14 from Norway attempted suicide due to harassment. This tragic event prompted a nationwide campaign to address and resolve the problem in Norwegian schools (Olweus, 1993). Similarly, countries such as Japan, the Netherlands, the United States, the United Kingdom, and Australia saw increased research funding and public awareness regarding harassment in the late 1980s and early 1990s.

Causes of Harassment

1. Studies have indicated that organizations characterized by significant power disparities are more prone to experiencing higher rates of sexual harassment compared to organizations with smaller power differentials (Ilies et al., 2003; NASEM, 2018; O'Callaghan et al., 2021; Sutton et al., 2021). This phenomenon is particularly evident in educational institutions where a substantial power gap exists between students and teachers. Furthermore, research has demonstrated that when power imbalances are exploited and sexual harassment occurs, the repercussions can be more detrimental than harassment perpetrated by individuals of equal power. Those who encounter sexual harassment from individuals with greater power tend to endure more severe consequences, including depression, emotional

exhaustion, and compromised physical well-being (NASEM, 2018).

2. The internet has brought about a number of unintended consequences, one of which is the ability for harassers to remain anonymous and target their victims with ease. One method that offenders employ is stealing the victim's photos from their social media profiles and manipulating them into offensive and unsettling images, which are then used as leverage against the victim. As a result, the victim is often coerced into complying with the harasser's demands due to the blackmail tactics employed.
3. Cultural norms and values in Khyber Pakhtunkhwa are also major factors in harassment in universities. For example, the concept of "izzat" (honor) is highly esteemed, and any conduct perceived as bringing shame to the family or community is strongly discouraged. This leads to the silencing of harassment victims out of fear of ruining their reputation or that of their families.
4. Khyber Pakhtunkhwa, like other areas of Pakistan, operates within a patriarchal society where men hold primary power and authority. This power dynamic can lead to the harassment of women, as men may feel entitled to exert control over female students.
5. Despite efforts to promote gender equality, a significant gap remains between men and women in our society, particularly in education. This inequality can contribute to the harassment of women, as they may be seen as inferior or less deserving of respect and dignity.
6. Inadequate education and awareness about sexual harassment and appropriate conduct can contribute to its prevalence in universities. Many students may not fully understand what constitutes harassment or how to report it, leading to a culture of silence and impunity.
7. Universities in Khyber Pakhtunkhwa may lack adequate mechanisms for addressing and preventing harassment. This can include inadequate policies, ineffective reporting procedures, and a failure to provide support services for victims.

Impact of Harassment

Psychological: Harassment has the potential to severely impact an individual's mental well-being, leading the victim to experience feelings of insecurity related to their physical appearance or the quality of their work. Perpetrators of harassment employ various tactics to undermine their victims, including spreading false rumors, making threatening gestures, assigning degrading tasks, and invading their privacy through stalking. Such degrading and intimidating conduct can result in lasting negative consequences on the victim's psyche, prompting them to doubt their aspirations, self-worth, and eventually succumb to profound depression. This, in turn, hampers their capacity to concentrate on their academic pursuits and affects their overall performance.

Social: Harassment also has a significant impact on the social life of the victim. People in our society often view them as culprits rather than offering support. They are avoided at many occasions and are subject to negative judgments. This attitude can make victims feel as if they are the actual culprits.

Legal and Institutional analysis

The Protection against Harassment of Women at Workplace Act, 2010 (annexed) is the primary legislation in Pakistan for preventing harassment in workplaces, including universities. This law provides a legal framework for preventing and addressing harassment, including sexual harassment, in educational institutions. Inspired by this, the Higher Education Commission (HEC) has also adopted an anti-harassment policy for universities and educational institutions across the country. Universities in Khyber Pakhtunkhwa have their own policies and mechanisms in place to address harassment. These policies are aligned with the Protection against Harassment of Women at Workplace Act, 2010, and provide specific procedures for reporting, investigating, and resolving harassment complaints.

Under the Protection against Harassment of Women at Workplace Act, 2010, each province in Pakistan, including Khyber Pakhtunkhwa, is required to establish an ombudsperson office to address harassment complaints. These offices are responsible for receiving, investigating, and

resolving complaints related to harassment in educational institutions and other workplaces.

Under this policy, educational institutions and universities have established Internal Complaints Committees (ICCs) to handle harassment complaints internally. These committees consist of members who are responsible for conducting impartial investigations and recommending appropriate actions in response to complaints.

Besides, all universities are required to conduct gender sensitization and awareness programs to educate students, faculty, and staff about issues related to harassment, its impacts, and the available mechanisms for reporting and seeking redress. They are also required to provide training and capacity-building sessions for members of the ICCs, faculty, staff, and students to effectively handle harassment complaints and create a safer environment on campus. It is essential for students, faculty, and staff to familiarize themselves with the relevant policies and procedures in place at their respective universities to address harassment effectively. Unfortunately, this is often limited to paperwork. According to a survey conducted for this study, a sample of 74 students (both male and female) was taken from three main public sector universities: the University of Peshawar, Agriculture University Peshawar, and Islamia College University Peshawar. It was quite astonishing that

Legal Framework at International and National level

The 1973 Constitution, unlike its predecessors, includes comprehensive provisions for the well-being of women. The 1973 Constitution not only protects women's fundamental rights but also provides guidelines, known as principles of policy, for the state to enact future laws related to women.

Despite the lack of practical efforts to improve the situation of women in Pakistan, the Pakistan Women's Rights Committee was established in 1976, nearly three decades after independence. This committee, consisting of 14 members with the Attorney General as its leader, was tasked with reviewing existing laws related to women in Pakistan and proposing recommendations for their advancement. In 1985, the Commission on the Status of Women was formed with 15 members and Begum Zari Sarfraz as its head. The third attempt to improve the status of women in Pakistan

was made in 1994 with the establishment of the Commission of Inquiry for Women. This commission, comprised of 10 members with Mr. Justice Nasir Aslam Zahid as its chairman, was responsible for reviewing existing laws and recommending measures to enhance the status of women in Pakistan. It stressed the need for institutions to promptly address incidents of gender discrimination, as Pakistan is obligated under the International Convention on Economic, Social, and Cultural Rights to align its domestic legislation with international standards. It is pertinent to mention that Article 7 of the convention recognizes the right of women to fair working conditions and reiterates that women should not be sexually harassed in their places of work.

International conventions signed by Pakistan

- International Convention on the Elimination of All Forms of Racial Discrimination – signed 1966.
- International Covenant on Civil and Political Rights – signed 2008
- International Covenant on Economic, Social and Cultural Rights – signed 2004.
- Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment – signed 2008.
- Convention on the Rights of the Child – signed 1990.
- Optional Protocol to the Convention on the Rights of the Child on the Sale of Children, Child Prostitution, and Child Pornography – signed 2011.
- Convention on the Rights of Persons with Disabilities – signed 2011.

Being a signatory to these conventions, Pakistan is obligated to gender-sensitize its laws. Thus, the following laws and rules have been framed over time.

General Laws (Pakistan Penal Code)

- **Section 510:** If a drunken person appears in a public place, causing annoyance to any individual, they can be punished with imprisonment, a fine, or both.
- **Section 509:** If a person labels any woman, utters disrespectful words, or behaves offensively through gestures, they are liable to a punishment of up to three years, a fine, or both.
- **Section 366A:** If a girl under the age of 18 is induced or forced to

perform sexual intercourse, the offender is liable to a punishment of up to 10 years and a fine.

- **Section 509:** If a person demands sexual favors and uses verbal or non-verbal communication to cause any form of annoyance, they are liable to a punishment of up to three years, a fine, or both.
- **Section 509:** If a person makes a false accusation of fornication against any woman, they are liable to five years in prison along with a fine.
- **Section 354A:** If a person assaults a woman using criminal force, strips off her clothes, and exposes her to public view, they are liable to punishment by death or imprisonment for life, along with a fine.
- **Section 294:** If a person uses indecent or vulgar language in a public place with the intention to offend, they are liable to a punishment of up to three years, along with a fine.

Local/Special Laws/policies

- The Higher Education Commission, Policy on Protection Against Sexual Harassment in Higher Education Institutions (Effective July 1, 2020)
- Protection Against Harassment of Women at the Workplace Act 2010, & Act 2022 - Amendment
- Enacted January 24, 2022, this amendment expands the definition of workplaces to encompass both formal and informal settings, bringing it closer to the definition set out in the 2019 ILO Violence and Harassment Convention (C190), which Pakistan has not ratified.
- The bill was drafted by the Federal Ministry of Human Rights with extensive input from women's rights groups and lawyers. The amendments aimed to ensure and facilitate increased participation of women in the workforce and address the shortcomings present in the existing law.
- The definition of harassment has been broadened. The law not only protects individuals against workplace harassment of a physical nature but also covers other forms of harassment and gender discrimination at the workplace.

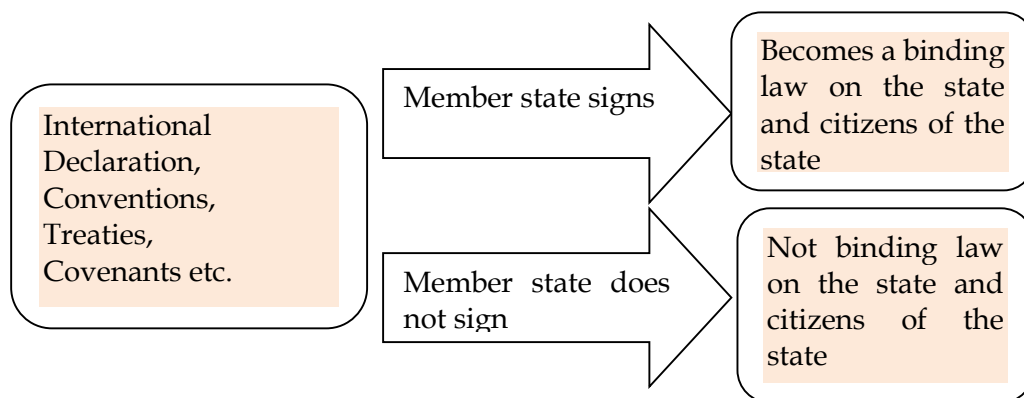
Resolution No. 48/104 of the General Assembly on the Declaration of Violence Against Women not only defines violence against women but also encompasses sexual harassment, emphasizing its prohibition in

workplaces and educational institutions. Articles 2(b) and 4(d-f) call upon authorities to implement penal, civil, or other administrative actions, along with preventive measures, to eradicate such behavior. Similarly, CEDAW is considered a significant step toward safeguarding women's rights, particularly in cases of sexual harassment.

Articles 7-16 of the mentioned convention clearly require state parties to take effective measures to eliminate discriminatory treatment against women in all aspects of life. The Charter of Fundamental Rights of the European Union has made extensive provisions for the prohibition of discriminatory treatment against women and has strengthened this position through a series of directives addressing sexual harassment.

Regarding guidelines for legislation on this subject, it is suggested that the United Nations and regional treaties can serve as guiding principles. The positive aspect is that sexual harassment has been recognized as a form of discrimination against women, as demonstrated in the Beijing Platform for Action. This platform emphasizes the responsibility of governments and employers to promptly adhere to its provisions by enacting legislation and implementing anti-harassment measures. Since the dawn of independence from colonial rule, Pakistan has been working to gender-sensitize its laws.

The way Legal Systems works in a Country:

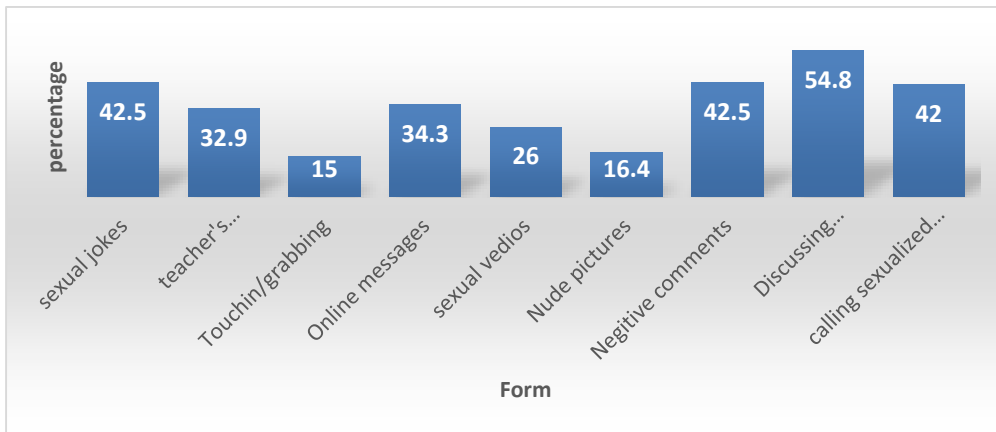


Situational analysis

Harassment events are increasing in universities in KP with each passing day. The nature of these events varies in magnitude and the response to

them. However, what is reported is only the tip of the iceberg. Many incidents occur without being reported. In a survey conducted for the purpose of this study, 100% of students (male and female) mentioned that harassment exists in their universities in one form or another, as pointed out in the questionnaire. Specifically, 78% indicated that they experienced direct harassment. Among the surveyed females, 23.7% reported personally experiencing harassment, while 21.9% of male students also mentioned being harassed at the university. However, only a few cases have surfaced publicly, such as the harassment incidents at Gomel University DIK. Similarly, according to the University of Peshawar, only eight cases have been reported in the past three years. "Since 2017, we have only received eight complaints at the University of Peshawar. None of them are against the faculty," claimed Dr. Abdur Rauf, head of the harassment committee at the university. Similarly, a Grade 18 lecturer at Khyber Medical University (KMU) in Peshawar was dismissed following a judgment of guilt in a case of sexual harassment by the university's Anti-Harassment Committee. These cases came to light due to significant debate on social media, mainstream media coverage, and a protest campaign led by Amna Ashfaq, a student from the Department of Political Science, which compelled the authorities to take notice (Munawar, 2021).

Table.1 showing percentage data of component wise harassment



Only 37.5% of those who said they had been harassed reported the event. Of those reports, half were settled through compromise, two were resolved by the committee, and one is still pending. This indicates that the issue is not taken seriously when it occurs.

Victims often choose not to report harassment due to fear of dishonoring their families or fear of retaliation.

According to sources from the Ombudsperson's office in Peshawar, they have received around 50 cases from Abdul Wali Khan University Mardan, Islamia University Peshawar, Abasyn University Peshawar, and other public and private universities in KP so far. This number is very small compared to the actual occurrences and perceptions on the ground. The main reason for this low number of registered cases is that the ombudsperson is not well known to students. When asked about the Ombudsperson, 100% of students were unaware of its existence and had no idea about it. This lack of awareness is not their fault, as neither the Ombudsperson's office nor the universities have adequately informed students. Most astonishingly, no university has posted any information about harassment and the ombudsperson on their website. It is only through social media that some students have become aware of the issue. Only 16.4% of students reported knowing about it due to their universities' awareness programs, which again shows that university efforts in this regard are minimal.

Context of Khyber Pakhtunkhwa

Pakistan, especially Khyber Pakhtunkhwa, is a male-dominated society where women are considered subordinate citizens (Ferdoos, 2005). Consequently, women spend most of their time at home and, due to purdah (veil), have limited exposure to male strangers. Confronting the 'male world' can thus be a traumatic experience for them (Syed et al., 2005; Shaheed, 1990). Many women have never been alone in a bank, a government office, a bookshop, or even a hospital (Ferdoos, 2005). The inability to interact with male strangers is closely linked to the purdah system, which is based on the absence of concepts for mixed social interactions and views relationships between non-mahram (non-blood-related) men and women as predominantly sexual (Ferdoos, 2005).

Religion is a significant element of Khyber Pakhtunkhwa society. According to the country's constitution, Islam is the state religion. The Objective Resolution, defined as 'the ground norm of Pakistan,' was an introduction to the successive constitutions of the Islamic Republic of Pakistan in 1956, 1962, and 1973 (Patel, 1991). Although Pakistan has laws, policies, and strategies for mitigating harassment, much work remains to

address this issue effectively. Furthermore, culture plays an important role in perpetuating gender stereotypes.

Issues and Challenges

The Male-Female Ratio: According to research conducted by Parker (2018), 49% of women perceive sexual harassment as common in male-dominated workplaces, while 33% believe it is prevalent in female-dominated workplaces. The majority of offenders were identified as male. Similarly, data from the EEOC reveals that 7,600 cases of sexual harassment were reported by men in 2019, with reports indicating that the perpetrator was typically male. In universities throughout KP, males outnumber females, increasing the risk of females being targeted.

Fear: Fear acts as a hindrance to personal growth and impedes progress. For instance, many female students from traditional Pathan families refrain from speaking out against instances of harassment due to the fear of tarnishing their family's reputation.

Power Differential: The primary reason for harassment is the power difference that exists between students and faculty. In the student-staff situation, the harasser holds a position of authority, enabling them to use force and punish their victims. This power dynamic compels the victim to remain silent, fearing seclusion, victim-blaming, negative impacts on their grades, and harm to their family's "honor."

Violence and Male Self-Perception: Regrettably, there is a prevalent issue of aggressive and violent behavior towards women in the province. The societal role of men has remained relatively unchanged compared to that of women, largely due to the patriarchal nature of society. This has fostered a belief among people that men are inherently more powerful and capable than women. The poisonous self-perception of some men is a direct result of this societal mindset, leading them to feel threatened by female education and the pursuit of economic equality for women. This distorted mindset can manifest in acts of sexual harassment as a misguided attempt to protect their own social status.

Credibility and Victim-Blaming: Victim-blaming is a highly significant issue that needs to be addressed. It is often observed that the majority of harassers

hold authoritative positions, which gives them more credibility compared to their subordinates or students (the victims). Furthermore, victims of sexual assault are unfairly blamed for their choice of clothing, their association with individuals of the opposite gender, and are unjustly labeled by society as 'used,' while the focus should be on holding the offender accountable for their actions. Consequently, by remaining silent and failing to bring the perpetrators to justice, those involved become no different from the harasser. This perpetuates an ongoing cycle of injustice within our society.

No Reporting: Various factors contribute to the lack of reporting, such as the apprehension of humiliation, the dread of public exposure, and occasionally the influence of certain individuals or acquaintances who encourage silence. As a result, no one comes forward to reveal the identities of the perpetrators.

Rapid Deforestation and Soil Erosion: Rapid deforestation in watershed areas compounds the problem by removing barriers to soil erosion. Due to soil erosion, the topmost fertile layer of soil is lost, leading to additional problems such as the silting up of dams, which decreases their lifespan. Moreover, tree logs and timber, transported during heavy floods, cause damage to infrastructure, especially bridges, by striking with full force.

Conclusion

Universities in Khyber Pakhtunkhwa are currently grappling with the issue of harassment, as studies indicate that it is exacerbated by factors such as the male-controlled nature of society, prevailing religious and traditional beliefs, and a pervasive sense of fear. Distress has consistently played a significant role, making it difficult to effectively address harassment cases or prevent the misuse of laws in the current environment. We have observed that harassment not only impacts the well-being of victims on individual, societal, and holistic levels, but has also become normalized to the point of being seen as discretionary in certain circles. The male-centric structure further exacerbates the victim's vulnerability by linking female virtue to family honor, leading to the victim being shamed rather than the perpetrator. Additionally, toxic standards of masculinity discourage male victims from seeking help, as they fear it may compromise their masculinity. The religious emphasis on modesty places the burden on victims to guard their honor and social status, further highlighting the gender biases in Pakistan's institutions and the weaknesses in its judicial system. It has become apparent that despite the existence of strict corporate policies against harassment in Pakistan, these policies are often not put into practice. Those in positions of authority tend to overpower or restrain reported incidents in order to protect the reputation of the institution, allowing the misconduct to continue without consequences. Furthermore, confidentiality agreements in settlement cases make it easy for perpetrators to move to other organizations while hiding their past convictions. Research also revealed that victims are more likely to face negative consequences for reporting such events rather than receiving the necessary support. Governing bodies responsible for addressing complaints showed negligence and often hindered inquiries by failing to recognize the seriousness of the situation.

The paper concluded that the most effective approach to addressing harassment is through the implementation of comprehensive anti-harassment training, bystander training, and the use of positive reinforcement to address the behavior of offenders. Human Resource departments should also develop improved reporting systems. Independent commissions should be established in locations separate from police premises to handle harassment cases. Additionally, it is crucial for legislation and laws to be properly enforced in order to protect human rights. The paper acknowledges the importance of instilling change from a young age, recognizing that

knowledge is a key factor in driving change. Therefore, changes in the curriculum are essential for cultivating a future generation of individuals who are open-minded and tolerant. Since academic frameworks often reflect and reinforce societal norms, it is evident that the most significant change that can combat harassment is a shift in cultural norms.

The current situation regarding handling such issues is extremely disheartening for those affected, as they have become accustomed to enduring harassment without speaking up. Perpetrators use derogatory language to refer to females and their bodies, and students feel that their complaints go unnoticed. This normalization of harassment has reached alarming levels, with many students facing mistreatment under the guise of friendly interactions with teachers who hold authority. Consequently, students often feel fearful, compromise their self-respect, and remain silent. The lack of reporting and awareness only worsens the situation. It is imperative to address this issue by implementing development and training programs, seminars, and educational materials to raise awareness and prevent further instances of harassment.

Recommendations

Based on the above discussion, the following recommendations are presented for mitigating harassment in universities in Khyber Pakhtunkhwa:

Monitoring and Evaluation: Pre-emptive Approach

Introducing policies is not enough; there should be a proper mechanism for monitoring the prevalence of harassment. This includes conducting regular surveys across the university to understand the perceptions and safety of all stakeholders and continuously adjusting the policies accordingly.

Ownership of the Leader:

Senior leadership must establish a culture of respect and inclusivity from the top down. This involves clearly communicating a commitment to zero tolerance for harassment of any kind. They should create confidential and accessible channels for reporting incidents of harassment. All reports must be taken seriously, with thorough investigations conducted and appropriate disciplinary steps taken if necessary.

Continuous improvement:

Preventing harassment requires constant attention and effort. Senior leaders should regularly assess the effectiveness of their policies and practices, solicit feedback from employees, and make adjustments as needed to ensure that the organization remains a safe and inclusive environment for all.

Education and Training:

Providing regular training sessions on harassment prevention and timely intervention equips employees with the knowledge and skills to identify, address, and report instances of harassment. Universities should ensure that these training programs are comprehensive, engaging, and accessible to all staff and students. There should be illustrative posters for awareness and guidance for those who face harassment, whether they are students or staff members. Regular sessions in collaboration with governmental and non-governmental organizations are required to sensitize all stakeholders. The administrative head should lead in this regard by emphasizing the issue in all speeches and meetings. The official website should also display a slogan of zero tolerance against harassment.

Students-HR relationship: collaborative approach

It is imperative for a collaborative effort between students and the Human Resource departments of universities to enhance reporting systems and establish a secure environment for individuals to report incidents of sexual harassment. Clear guidelines outlining the definition of harassment, prohibited behaviors, and the corresponding disciplinary actions must be provided by HR. Each report of harassment should be treated confidentially to safeguard the victim from any direct consequences. The Human Resource department should invest in training an adequate number of staff members to serve as complaint officers, empowered to enforce disciplinary measures and offer counseling to both the victim and the offender. This demonstration of commitment by the administration will play a crucial role in eliminating institutional harassment by challenging existing norms.

Negative reinforcement: social approach

Most universities offer comprehensive training to staff on addressing instances of sexual harassment through presentations and manuals, but these methods often fall short. Therefore, universities should consider implementing a strategy of undesirable reinforcement when dealing with colleagues (perpetrators) involved in sexual harassment incidents. While it may initially seem uncomfortable to provide negative feedback to a coworker, proper training on communication techniques can help the perpetrator understand their wrongdoing in a non-confrontational manner and decrease the likelihood of future incidents. Taking a stand against sexual harassment not only boosts confidence and a sense of justice among employees but also fosters a safe and supportive work environment that enhances overall performance. Bystander training is essential in achieving this goal, focusing on educating individuals on recognizing the issue, addressing it, supporting the victim, and effectively intervening to prevent further harassment.

Third party utilization:

In order to guarantee the security and safety of victims in harassment cases, utilizing a third-party entity, such as an ombudsman, has proven to be effective. These third-party organizations offer anonymous reporting systems and possess the necessary expertise to handle such cases, thereby providing protection on behalf of the victim's university. Following their investigation, these third-party entities present a range of options and solutions to universities, including the termination of the harasser's contract or the issuance of warning letters, among others. However, the success of this approach ultimately hinges on the employer's commitment to the well-being of their students, rather than prioritizing the reputation of the university.

Linking all complaint platforms with Ombudsman office:

Occasionally, students may feel hesitant to trust the redressal system at the university level due to the fact that they are all part of the same university community, potentially leading to a bias towards their peers. This can result in instances of harassment going unreported. To address this issue, it is recommended that the ombudsman office be integrated with all complaint platforms, allowing complainants to directly submit their cases to the ombudsman for thorough investigation. Not only will this approach help in providing satisfaction to the victim throughout the process, but it will also

serve as a mechanism to hold all parties involved accountable. Additionally, it will contribute to ensuring the safety and security of the victim.

Curricula change: Psychological approach

Lastly, it is imperative to instill a sense of change among the younger generation, recognizing knowledge as a crucial element for transformation. Modifying educational curricula plays a vital role in shaping future individuals as unbiased and tolerant citizens. Change originates from within a society, and since academic contexts reflect and reinforce social, traditional, and cultural values, it is essential for Pakistan's educational interventions to be based on principles that advocate for equality, thereby satisfying the masses and fundamentally altering existing biased perspectives. Moving forward, education must transition from mere endorsement to interactive learning environments that foster individuals capable of drawing logical conclusions, finding more satisfactory solutions to global issues, and resisting manipulation. These individuals should possess the ability to adapt to change and maintain rationality when necessary. The most significant change contributing to the eradication of harassment is a transformation in cultural norms.

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Evaluating and Proposing Strategies for Ph.D. Scholarships in Pakistani Higher Education

Ambreen Asghar¹

Mr. Shabidullah²

KJPP

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Abstract:

The Higher Education Commission (HEC) of Pakistan, established in 2002, aims to enhance the country's higher education system to foster socio-economic development. Despite the development of the HEC Vision 2025, which outlines a strategic approach to improving education quality, relevance, and accessibility, challenges persist in policy execution and resource allocation. The HEC Vision 2025 emphasizes innovation, research, and global academic partnerships but struggles with inconsistencies and insufficient funding for research and development. The paper highlights key issues including federal-provincial conflicts, inadequate investment in R&D, and the need for effective policy implementation. Recommendations for addressing these challenges include resolving devolution disputes, introducing split scholarship programs, adopting the Triple Helix model, utilizing modern technology like GIS, engaging donors and private entities, and ensuring equitable access to higher education across all regions. A strategic focus on these areas could potentially lead to significant improvements in the effectiveness of Ph.D. scholarships and overall socio-economic growth.

Key words:

Higher Education Commission, Ph.D. Scholarships, Vision 2025, Research and Development, Policy Implementation

¹ Currently posted as Deputy Secretary, Higher Education Department, Government of Azad Jammu & Kashmir

² Faculty Advisor

Introduction

The Higher Education Commission (formerly University Grants Commission) was established in 2002 with the aim of developing and improving Pakistan's higher education system, which could consequently boost both the social and economic sectors of Pakistan. Since its creation, improving the standard of education and research conducted by the organization with highly trained faculty has been a primary goal of the HEC. The HEC developed Vision 2025, a strategic plan outlining how to change the country's higher education system. By encouraging a culture of innovation, research, and entrepreneurship, the vision seeks to improve the quality, relevance, and accessibility of education. It places a strong emphasis on developing competent human resources who can address today's challenges and advance the country's growth. The HEC aims to establish Pakistan as a major player in global education and research while constructing a knowledge-based economy through partnerships with foreign entities, industry, and academia. Faculty development, improving infrastructure, updating curricula, and ensuring fair access to education for various populations are among the main priorities (HEC, 2024).

The HEC has framed many policies to translate Vision 2025 into the socio-economic growth of the country, including the HEC Graduate Education Policy, the Interim Placement of Fresh Ph.D. Policy, and the Foreign Collaboration Policy, among others (ibid.). However, the execution mechanisms still need to be established. The HEC is facing many challenges. Pakistan spends a remarkably small amount on research and development. In South Asia, less than 0.25% of GDP is invested in R&D, which is less than half of the region's already low investment levels (Rab, M., & Jones, C. S., 2015). Moreover, there is an ongoing debate regarding the devolution of powers following the 18th Constitutional Amendment that needs to be addressed to ensure equitable access to Ph.D. scholarships for all regions (The Express Tribune, 2018, December 9).

Problem Statement

There is no denying that the HEC has framed policies to ensure the equitable distribution of Ph.D. scholarships to all regions of the country and to foster

collaborations with industries in research and development. However, there is a perception among the public and educationists that these policies are not translating into the socio-economic growth of the country. Therefore, the research calls for identifying the gaps in the policies and the execution framework adopted by the HEC in this regard.

RESEARCH QUESTIONS

Post-18th Constitutional Amendment, is the role of the HEC effective in the fair and equitable distribution of Ph.D. scholarships to all regions of the country?

Are the linkages between academia, industry, and government productive in enhancing the efficacy of these scholarships?

Is the role of the R&D wing of the HEC effective in assessing market needs and accordingly making recommendations for Ph.D. scholarships?

SCOPE

This study analyzes the current status of Ph.D. scholarships in the country, budget allocation, HEC policies, their effectiveness regarding equitable access, skill development, technology transfer, R&D initiatives, public-private partnerships, linkages with industries, foreign collaborations, and alignment with modern world demands. The study will utilize available data from the HEC website for analysis. The loopholes and gaps in policies and execution mechanisms will be identified, and recommendations in the form of pragmatic solutions will be suggested.

Literature Review

(Pro-Pakistani, 2022, June 10) noted that in the budget for FY 2022-23, the Ministry of Finance allotted Rs. 109 billion to the Higher Education Commission (HEC), out of which Rs. 65 billion was for non-development and Rs. 44 billion was for development. Analysis indicates a mere 0.3% increase from the previous year, despite assertions of a 67% increase by the administration.

(Zia et al., 2023) described financial constraints as one of the key obstacles to the growth of Pakistan's higher education sector and suggested addressing it through collaborations with private entities, civil society organizations, or international donors.

According to (The Express Tribune, 2018, December 9), examining the language of the 18th Amendment to the Constitution in detail shows that the federal government is responsible for supervising matters related to higher degrees from abroad as per Entry No. 16 (Part-I) in the Federal Legislative List (FLL), such as managing foreign scholarships and issuing equivalencies.

However, issues related to education planning and standard setting for higher education, research, scientific, and technical institutions fall under the jurisdiction of the Council of Common Interests (CCI).

(Khawar, A., Arif, S., & Gull, F., 2021) found that years of concern about the HEC's devolution might have taught us that implementation requires better planning and clearer aims, not just at the highest level. "If we have confidence that provinces can implement standards adequately, we can delegate powers to them in the spirit of the 18th amendment," stated the newly appointed head of the HEC. Therefore, having meaningful conversations with all parties involved and increasing the capacity of provincial HECs are the best ways to improve our higher education system moving forward. To prevent internal patronage politics from overwhelming the higher education reform agenda, transparency and autonomy will be crucial.

(Qutoshi, S. B., 2015) highlighted the importance of equitable access to providing quality higher education to the residents of Pakistan. He pointed out that the policy framework is a major factor, and pragmatic steps are necessary to ensure its implementation.

(Cai & Amaral, 2021) described the linkages between government, academia, and industries as the key drivers for bringing economic growth to the country. They highlighted the role played by the R&D wing of any institution in this process.

(Turi, F., & Khan, M. B., 2021) also proved that research and development are crucial components of a knowledge-based economy; hence, Pakistan is seeking a wide range of researchers with the capacity to conduct excellent applied scientific research. Reducing the gap between industry and academia can facilitate the conversion of scientific information and research into industrial output, further promoting economic growth. Regrettably, compared to other emerging and industrialized nations, Pakistan's overall expenditure on research and development is minuscule. National research and development organizations should recognize the value of R&D in light

of globalization and heightened competition and take appropriate measures to enhance their R&D initiatives.

Analysis *Situational Analysis*

Budget:

The government's modest increase of around 5.5 percent above the revised allocation of the current financial year to Rs. 97.098 billion for the education sector and services in the federal budget for the financial year 2023–24 has garnered both attention and criticism. Pakistan is ranked lowest in the region for supporting education, with public education spending as a proportion of GDP anticipated to be 1.7% for the fiscal year 2022–2023. Education activists and academics have stressed the need for more funding in the education sector to address issues and gaps in high-quality education. Since the 18th Amendment to the Constitution, the federal government has primarily focused on subsidizing higher education, with provinces taking on more responsibility for education. Accordingly, an increase over the previous year's allocation of Rs. 59.71 billion has been provided to the Higher Education Commission (HEC) under the Public Sector Development Programme (PSDP) for the fiscal year 2023–2024 (Pakistan Today, 2023, June 9).

According to the Pakistan Planning Commission (n.d.), the country aims to increase the number of Ph.D. scholars to 15,000, which seems quite unlikely with such a budget allocation.

Ph.D. Scholarships:

According to the HEC (2024), a total of 3,044 scholarships (1,103 foreign and 1,941 local) have been granted by the HEC under different scholarship schemes/projects over the last five years. The breakdown of scholarships (local as well as foreign) awarded is as follows:

Category	Program	Total
Local Scholarships	MS/MPhil	1048
	Ph.D.	893
Total		1941
Foreign Scholarships	MS/MPhil	81
	Ph.D.	1022
Total		1103

Discipline wise bifurcation:

Discipline	Local Scholarships	Foreign Scholarships
Agriculture & Veterinary Sciences	413	134
Arts & Humanities	185	15

Biological & Medical Sciences	231	231
Business Education	148	55
Engineering & Technology	361	371
Physical Science	288	183
Social Sciences	315	114

Trends in Public & Private Sectors:

According to HEC (2024), there is a clear increase in Ph.D. production over the years, indicating growth and investment in research and higher education within the public sector, while the numbers in the private sector are significantly lower than in the public sector. Pakistan's public sector continues to be the main producer of Ph.D.s, which is not surprising given its greater infrastructure, resources, and emphasis on research and higher education. Although on a smaller scale, the private sector is also expanding and contributing to the academic scene. Cooperation across these sectors might further enhance the nation's R&D and innovation.

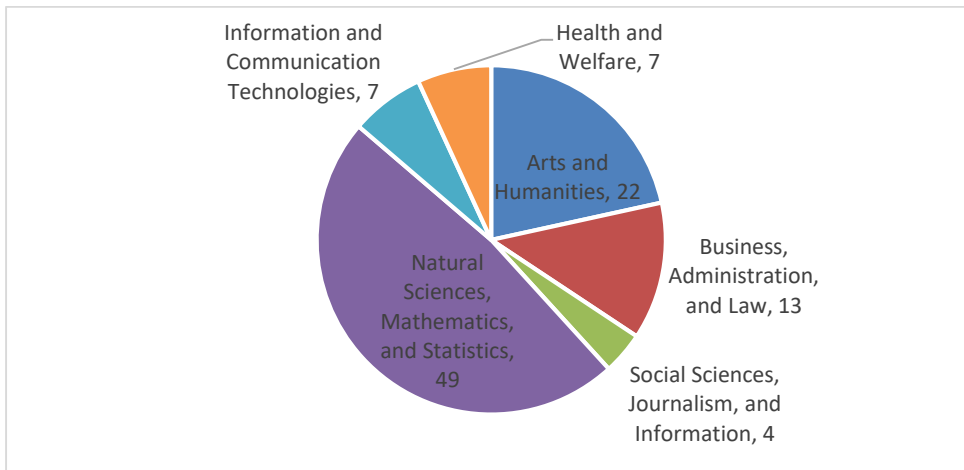
Ph.D. Faculty:

The development of human resources has consumed a significant portion of the HEC's budget since its founding, aimed at generating Ph.D. staff for universities. However, despite the increasing number of DAIs and students in the higher education sector, the overall ratio of Ph.D. faculty to non-Ph.D. faculty remains unchanged. On both national and international levels, institutions' rankings, publications, quality, accessibility, and R&D initiatives have all improved. New initiatives and continued development funding are required to increase the percentage of Ph.D. faculty compared to non-Ph.D. professors (ibid.).

Comparative Analysis of Ph.D. Enrollments in Balochistan & Federal

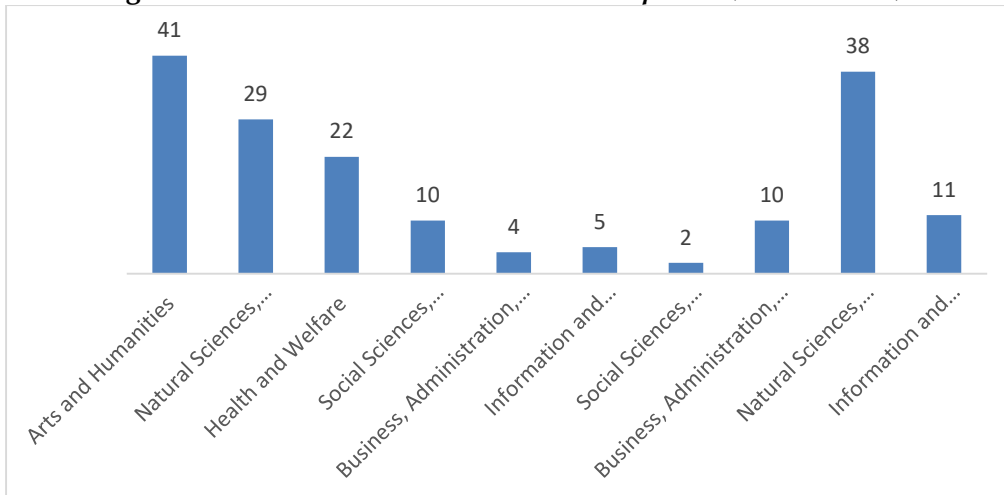
According to the data available on the HEC website for the years 2018-19, the pie chart below shows Ph.D. enrollments among female candidates across different disciplines and universities in Balochistan:

Figure 1 Female Enrollment in various disciplines (Baluchistan)



The graph below shows Ph.D. enrollments among male candidates across different disciplines and universities in Balochistan:

Figure 2 Male Enrollment in various disciplines (Baluchistan)



Source: HEC

The table below shows Ph.D. enrollments among female and male candidates across different disciplines and universities at the federal level:

Table 1 Enrolment of PhD in various disciplines

Discipline	Enrollment	
	Female	Male
Social Sciences, Journalism, and Information	595	684

Discipline	Enrollment	
	Female	Male
Natural Sciences, Mathematics, and Statistics	438	1,181
Business, Administration, and Law	295	1,023
Information and Communication Technologies (ICTs)	169	370
Engineering, Manufacturing, and Construction	113	706
Health and Welfare	70	115
Arts and Humanities	114	255
Agriculture, Forestry, Fisheries, and Veterinary	51	39
Education	40	46
Services	21	79
Total	1906	4498

Source: HEC

The comparison between enrollments in the Federal and Balochistan regions shows a stark difference, proving that the HEC has failed to achieve its objective of ensuring equitable access to higher education opportunities in remote areas.

Pakistan Vision 2025:

In order to fulfill Pakistan's Vision 2025 for its national human resource needs, the Higher Education Commission conducted the National Human Resource Development Conference on October 13, 2015. There were about 150 participants from Pakistan, including academia, intellectuals, researchers, entrepreneurs, and professionals. Fields and areas of research such as social sciences, new higher education trends, physical sciences, medical sciences, engineering and technology, business education, development studies, economics, biological sciences, arts and humanities, and agricultural studies were identified as strategically important for Pakistan's development in the next ten years, considering the China-Pakistan Economic Corridor. In total, 11 focus groups representing academia, industry, and R&D were formed (ibid.). However, no pragmatic steps have been taken by the Commission yet for implementation.

Initiatives Taken by HEC:

HEC has launched a new initiative aimed at training 1,800 Ph.D. candidates in potentially critical subjects identified by R&D staff, business, and academia. These scholars will complete their doctorates at prestigious universities around the globe and enhance Pakistani research and teaching standards. The program further aims to create and enhance connections

between individuals and institutions. Scholarships will be awarded based on the data submitted by candidates. The goals include developing a critical mass of highly skilled scientists and technicians, building capacity at academic institutions, R&D centers, and business sectors, and generating intellectual activity through research publications. It is anticipated that the program will boost R&D, initiate new initiatives with financial benefits, and assist in advancing technology. It will support HEC's efforts to address Pakistan's economic needs, create high standards in education, and supply skilled Ph.D. workers. The program's overarching objective is to strengthen Pakistan's research and development environment while tackling the country's economic issues (HEC, 2024).

The Higher Education Commission of Pakistan provides full-time Ph.D. candidates with a six-month research fellowship overseas with the goal of improving research quality, producing highly skilled labor, and facilitating information transfer for rapid economic advancement. The goals encompass offering educational opportunities, cultivating global cooperation, showcasing Pakistani talent internationally, and promoting the dissemination and standardization of research. The main disciplines covered in the provided data include Arts & Humanities; Social, Behavioral & Economic Sciences; Urban Planning; Climate Change and Environment; Information Technology and Telecom; Innovative Governance and Reforms; Police Sciences; Agricultural Sciences; Biological & Health Sciences; Engineering & Technology; and Mathematical & Physical Sciences (ibid.).

The mission of HEC is to support and encourage Higher Education Institutions (HEIs) to prioritize research to ensure sustainable economic growth and a knowledge-based economy in the future. Universities are establishing centers for this purpose, which will operate as hubs and house all research operations under one roof, from developing research proposals to commercializing research results. These centers will be named "Offices of Research, Innovation, and Commercialization (ORICs)." To ensure the availability of well-established and fully operational ORICs, HEC has begun organizing the research activities of universities and higher education institutions. These ORICs will play a crucial role in facilitating the results of the university's research projects by offering strategic and operational assistance to research-related programs and activities. The primary goal of these studies is to transform invention – pure knowledge – into innovation – products and manufacturing methods – which can eventually improve the well-being of society as a whole. A second scholarship program was also established for the coastal regions of Balochistan, in addition to 5,000 scholarships for Balochistan and the amalgamated tribal districts. New funding has been granted for engineering and technology universities to purchase cutting-edge equipment, and the Prime Minister's Laptop Scheme (ibid.).

The Foreign Scholarship USAID Merit and Need-Based Scholarship program is funded by the US government through EAD. No negotiations are made on discipline with any donor or HEC partner agency abroad. Scholarships are awarded based on merit and placement is determined by university ranking. Scholars are required to serve Pakistan for five years after completing their studies; therefore, they are monitored regularly. The failure and absconding rate is less than 2% (ibid.).

GAP ANALYSIS

Following gaps have been identified in the policies of HEC from the study:

- Policies are generally based on an idealistic approach. No financial sustainability analysis has been conducted, even though Vision 2025 aims to increase Ph.D. numbers to 15,000.
- The policies appear to be a wish list as no strategies have been devised for the practical execution of the policies.
- While everything is documented, there is practically no involvement of think tanks and the industry sector. An "Innovation Steering Committee" was to be formed, but no information is available regarding this with HEC to date.
- Donors have not been consulted regarding the disciplines of scholarships that could address local needs as well as modern world demands.
- There is no focus on using modern technologies such as GIS for mapping or creating clusters for industrial bases.
- There is no alignment of disciplines according to regional peculiarities.
- Market demands are ignored, and there is no technology transfer.

Stakeholder Analysis

The study identifies GoP, HEC, EAD, CCI, provinces, the private sector, and civil society organizations as major stakeholders in terms of their role, influence, and power.

Stakeholder 1: HEC & Provinces

Although HEC devolution is a complex issue, disagreements between legislators, regulators, and university representatives over its implementation should be resolved immediately. Devolution is usually beneficial but requires proper procedures and structures. In Pakistan, higher education was devolved without adequate planning. Two provinces, Sindh and Punjab, have established their own HECs. The head of the HEC once stated, "If we have confidence that provinces can implement standards adequately, we can delegate powers to them in the spirit of the 18th amendment." Therefore, engaging in logical and meaningful conversations with all parties involved and increasing the capacity of provincial HECs are crucial for improving the higher education system.

Engagement Strategy:

Both parties should pursue conflict resolution through negotiations, aiming for a win-win situation. The CCI must play its role in effectively resolving the issue to build the capacity of provincial HECs and ensure equitable access to all regions, especially the marginalized areas.

Stakeholder 2: EAD & Foreign Donors

Another important stakeholder is EAD. Foreign-funded scholarships should be negotiated to align with local needs and modern world demands.

Engagement Strategy:

HEC should conduct prior research on the most in-demand fields, both locally and internationally. This information should then be used to negotiate with foreign donors through the EAD forum to allocate scholarships in the most sought-after and relevant disciplines.

Stakeholder 3: Private Entities, NGOs & Civil Society Organizations

Private entities, NGOs, and civil society organizations can also play a crucial role, as the government cannot fund all scholarship programs due to financial constraints.

Engagement Strategy:

The local community and the Ministry of Education can play vital roles in negotiating, forming alliances, and collaborating with these stakeholders.

RESULTS/IMPACTS

Although HEC is producing a reasonable number of Ph.D.s, its impact on the socioeconomic growth of the country is not evident. Simply increasing the number of scholars without addressing local needs and global market demands is not a pragmatic approach. This approach does not add value to the system; rather, the liability of unemployed scholars is a concerning sign for the country's growth. The scarcity of resources, both human and financial, hinders the development of the R&D sector, which is crucial for economic growth. Additionally, unresolved conflicts between federal and provincial governments contribute to unequal access to Ph.D. scholarships and higher education across all regions of the country.

INTERNATIONAL BEST PRACTICES

China and the United Kingdom have been selected as examples of international best practices in the field of higher education. Both countries have developed advanced research agendas that address global knowledge

contributions and local developmental challenges. The Grand Challenges initiative, launched by University College London (UCL), positions UCL as a leader in specific research fields. These Grand Challenges are designed to inspire cross-disciplinary research.

Universities in both China and the United Kingdom receive block funding grants to allocate towards self-determined projects, fostering specialization and collaboration with the private sector. China aims to allocate 2.5% of its GDP to research and innovation. In the UK, government funding is mediated through the Research Excellence Framework, which promotes research quality and provides long-term grants.

Research Councils lead research evaluation, funding allocation, and agenda-setting in both countries. They ensure competitive peer review, establish research themes, and report on research status to the government and industry. Professional associations promote peer review practices and communities of practice within specific domains. Governments establish special commissions to address particular research and innovation questions, involving academics and practitioners.

Universities and researchers undergo long-term review cycles, which allow for the maturation of research quality and institutional excellence. Leading researchers and departments receive additional support as exemplars of their disciplines. Local collaboration and networking are actively encouraged, alongside engagement with international research networks. Academic research informs government policymaking in both countries, with varying degrees of formalization and direct reporting relationships.

Conclusion

The study concludes that while the vision is present, the execution mechanisms are not pragmatically designed. The policies appear sound on paper; however, they are inconsistent with the availability of resources and the peculiarities of the region. The main challenge is the lack of coordination among different stakeholders. The conflict between the federal and provincial governments following the 18th Amendment to the Constitution needs to be resolved to provide equitable access to higher education for all regions of the country, especially the marginalized ones. Self-sufficiency and judicious investment in all potential sectors (primarily R&D, linkages with academia, and capacity building) can lead to the benefits of Ph.D. scholarships. The absence of a modern and innovative approach is why Pakistan is lagging behind other countries in socio-economic growth. Aligning research disciplines with the demands of the modern world can drive this change.

Recommendations

The 80/20 rule, which forms the basis of the Pareto Principle, states that 80% of the results come from 20% of the effort. In other words, 20% of the causes account for 80% of the issues. By focusing on these 20% major areas, 80% of the issues related to the formulation of strategies for effective Ph.D. scholarships could be resolved. Here are the major recommendations:

Removal of Institutional Fragmentation

The dispute over devolution after the 18th Amendment should be resolved immediately, considering the capacity-building issues of provincial HECs. A collaborative approach should be applied.

Key players: The CCI is crucial in this regard. It can effectively engage both parties and make informed decisions based on past data and experiences.

Introduction of Split Scholarship Programs

While foreign scholarships have set the path for higher education and fulfilled their intended goal in the short term, they lack local applicability and require greater attention to be more significant and fruitful. Split scholarship programs should incorporate both international and local elements. Students should be aware of community issues and strive to improve by traveling abroad and learning from developed nations.

Key players: The education ministry at the federal level and education departments in the provinces can address local needs. For foreign scholarships, foreign ambassadors, consulate general offices, trade and community welfare attachés, and EAD can engage in effective negotiations.

Adoption of the Triple Helix Model

This model should be adopted in its true spirit. Proper mechanisms need to be devised for this purpose. The proposed committees (like the Innovative Steering Committee) in the policies should be practically involved in the process.

Key players: The Chamber of Commerce & Industry and HEC have a primary role.

Use of Technology like GIS

Modern technologies like GIS should be used to form clusters for establishing industrial bases by determining the geographical locations where particular resources are present. Local scholarships may be offered accordingly to address the needs of specific localities.

Key players: The Ministry of Information & Technology and the Chamber of

Commerce & Industry should be engaged by the Ministry of Education in coordination with HEC.

Negotiations with Donors, Private Entities, & Civil Society Organizations

Due to funding constraints, donors, private entities, and civil society organizations should be engaged in discussions to provide human and financial resources. This can help invest in scholarships and R&D, ultimately contributing to the country's economic growth.

Key players: HEC, EAD, and community representatives can play an active role.

Ensuring Equitable Access to Opportunities for All Regions

Need-based scholarships should be encouraged to support disadvantaged segments of society. Additionally, the establishment of public or private sector universities should be prioritized in remote areas.

Key players: Political leadership, HEC, and donors are the main contributors to achieving this goal. This could be a medium- to long-term objective.

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Unifying Tracks, Evaluating the Standardization of Railway Gauge for Enhanced International Connectivity and Forward Looking Recommendations

Gul Hassan¹

Dr. Muqeem-ul-Islam²

KJPP

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Abstract:

Railways are a crucial mode of transportation for both freight and passengers, with a longstanding historical presence in industrialized nations. Pakistan Railways, the second largest institution in the country, has historically used Broad Gauge (BG) tracks, which have significant strategic and operational importance. This paper examines the feasibility of converting Pakistan Railways' BG network to Standard Gauge (SG) and finds it impractical due to prohibitive costs and operational disruptions. The analysis reveals that while SG offers advantages in terms of spare parts and market access, the high cost and operational challenges of converting existing BG tracks outweigh the benefits. The paper concludes that SG should only be introduced in isolated new networks or cross-border areas where gauge breaks are unavoidable. Recommendations include maintaining the current BG system, constructing new SG lines in strategic locations, and enhancing local production capabilities to reduce dependency on international markets.

Key words:

Railways, Broad Gauge, Standard Gauge, Pakistan Railways, Track Conversion

1 Divisional Mechanical Engineer/KDA, Mechanical Engineering Department, Ministry of Railways

2 Faculty Advisor

Introduction

Railways function as the principal mode of transportation for both freight and passengers. Railways emerge as the most efficient, quickest, and cheapest mode for transporting people and goods worldwide. All industrialized and developed nations have established railway networks throughout their territories. The most notable progress in railways has been witnessed during the last two decades in our neighboring country, China. Pakistan Railways stands as the second largest institution after the armed forces. Pakistan Railways has played a pivotal role in conveying goods and people across the country and is also recognized as a means of transportation for the common people. Pakistan Railways is also significant in wartime, aiding the armed forces in the efficient and safe transportation of troops, ammunition, and equipment. Pakistan Railways plays a vital role in positioning Pakistan as a central global hub for international transportation and trade due to the geographical location of Pakistan.

The internal distance between two running rails of track is referred to as track gauge. The track is a major component in railways, and the selection of track gauge has always remained a complex issue throughout the history of railways. There are various types of gauges used worldwide. The principal gauges include the Standard Gauge (4'-8.5" or 1435 mm), the Broad Gauge Russian BG (4'-11 27/32" or 1520 mm) and Indian BG (5'-6" or 1676 mm) also used in Pakistan, Meter Gauge (MG) (3'-3 3/8" or 1000 mm), and Narrow Gauge (NG), the gauge below 1000 mm but mostly 2'-6". Every gauge has its own significance and is adopted in different countries considering strategic, financial, or operational reasons. Nowadays, most countries in the world have adopted the Standard Gauge (1435 mm). Countries that have adopted SG for their railroad networks not only possess an advantage in the procurement of spares but also have access to a large market for purchasing track machinery, locomotives, and carriages. Therefore, it seems that shifting from the BG system to Standard Gauge would be advantageous in the future for countries that have not yet adopted it, such as Pakistan, where manufacturing facilities are not available. The national track gauge of Pakistan is Broad Gauge, which is the only operational gauge in the Pakistan Railways network. Historically, the first Broad Gauge (BG) railway line in Pakistan was inaugurated on May 13, 1861, for public traffic between Karachi city and Kotri, a distance of 169 km. The tracks in most sections of PR were laid for strategic purposes to safeguard the British Empire in the Subcontinent. At present, only BG track is operational in PR. The total route length of the PR network is 7791 km, while the total length is 11881 km as of June 30, 2020. The length of BG track is 7479 route km and 11492 track km. The length of Meter Gauge track is 312 route km and 389 track km, existing in PR but non-operational (Ministry of

Railways, 2020).

Statement of the Problem

Pakistan Railways inherited a variety of rail widths, including Broad Gauge (BG), Meter Gauge (MG), and Narrow Gauge (NG), which were laid by the British primarily for strategic purposes. Presently, only the BG track remains operational in Pakistan. Despite the widespread acceptance of Standard Gauge in most countries, such as those in Europe, America, and China, PR has persisted in constructing new tracks using the BG gauge. Pakistan Railways relies entirely on Europe and other nations for the importation of locomotives and rolling stock due to the absence of local manufacturing facilities and technology. Consequently, manufacturers must tailor their products to meet the requirements of Pakistan Railways for the broad gauge track, incurring significant costs and time. Given these constraints, there is an urgent need for Pakistan Railways to contemplate adopting the Standard Gauge. However, the feasibility of introducing SG on the existing PR network or international borders poses considerable technical, operational, and financial challenges that must be precisely evaluated.

Significance and Scope of Research

Considering the realities of elevated expenses and the shortage of BG rolling stock and locomotives, the importance of the Standard Gauge system rises. The objective of the study is to examine all the strategic, technical, operational, and financial dimensions of implementing Standard Gauge in Pakistan Railways. The investigation will concentrate on determining the extent to which SG should be implemented either across the entire PR network or in segments thereof. A detailed examination of the pros and cons of introducing SG in PR will be conducted.

Literature review

Examination of literature such as the Battle of Gauges in India, Standardization of Railway Track Gauge, Railroad Gauges and Spatial Interaction, and the Gauge Committee Report proved invaluable in comprehending the historical context and comparative analysis of various gauges. The literature review on railway track gauges underscores that Standard Gauge earned its name for unifying the diverse gauges prevalent in Great Britain during the 19th century. Other nations adopted this gauge due to Great Britain's influential status and the availability of SG locomotive technology at that time (Puffert, 2001). Additionally, historical accounts suggest that the BG track was considered superior to SG upon its introduction in India in 1853 (Murthi, 1953). Moreover, Broad Gauge emerged victorious

over Standard Gauge in 1845 trials conducted to determine the optimal gauge for the United Kingdom (Siddall, 1969). While no direct research specifically addresses the need to introduce SG in Pakistan Railways, pertinent data from the Chief Engineer Survey & Construction PR HQ records of feasibility studies, Railway CPEC ML-1 data, and CAREC Railway Strategy 2017-30 (CAREC Secretariat, 2017) have proven instrumental in analyzing the situation. Considering Pakistan's strategic and geographical location, the question arises whether Standard Gauge adaptation in PR or adherence to existing BG tracks is preferable.

Methodology

Both quantitative and qualitative methodological approaches are considered to analyze diverse datasets and information. The research methodology for this paper relies on data acquired from various branches of Pakistan Railways concerning the existing information on the Broad-Gauge system, data from electronic sources, and Railway CPEC data of the ML-1 project. Quantitative data concerning the prevalence of SG globally and rough estimations of conversion costs from existing BG tracks of PR to SG tracks will be juxtaposed to derive conclusions. Similarly, strategic factors pertaining to cross-border rail connectivity with Iran, Afghanistan, India, and China will be scrutinized. Through this analysis, conclusions will be drawn, and recommendations will be provided to ascertain the optimal gauge choice for the PR network, considering future prospects.

Organization of the Paper

The research paper is divided into two sections to facilitate simplicity, comprehension, and logical flow. The first section focuses on the comparative analysis of Standard Gauge and Broad Gauge. It delves into the historical background of both gauges and discusses their technical, financial, and operational aspects. The second section explores the determinants of introducing SG to Pakistan Railways and the associated challenges. This section examines three different scenarios for the introduction of SG in PR: on ML-1 alone, across the entire PR network, or on border tracks with India, China, Afghanistan, and Iran. Drawing on the analyses from both sections, conclusions will be drawn, and recommendations will be provided accordingly.

Comparative Analysis of Broad and Standard Track Gauges

History of Standard and Broad Gauges

The Standard Gauge, measuring 4 feet 8.5 inches (1435 mm), originated with George Stephenson's pioneering Liverpool & Manchester line in 1830 in

England (Puffert, 2001). Also referred to as the Stephenson gauge or sometimes the international gauge, it was exported from Britain to Europe and the United States alongside British locomotives built to fit it. However, no study has conclusively established whether the Standard Gauge is technically or economically superior or inferior. Its initial adoption by Stephenson was little tested, and its widespread adoption resulted from the expansion of rail transport to this gauge. Stephenson's adoption of the gauge was not due to any inherent technical superiority; rather, he followed the precedent of the 4'-8" gauge prevalent since 1825 on the Stockton and Darlington Railways in Great Britain, merely adding half an inch to allow more space between rails and wheel flanges. As Stephenson's son Robert later testified to a parliamentary commission, his father did not "propose" the gauge but rather "adopted" what was already in use in his home region. The British standard gauge was later adopted by Europe and America with the export of British locomotives built on the standard gauge. Another reason for its widespread adoption, particularly in Europe, was the interconnectivity of all European countries, aimed at increasing trade and facilitating travel for people across different nations (Puffert, 2001).

In 1845, a Gauge Commission was established to determine the best gauge for the UK. Trials were conducted on Broad Gauge and Standard Gauge locomotives, with the Broad Gauge winning. However, the Commission recommended the adoption of the 4 ft 8½ inch track gauge for the United Kingdom, primarily because the Standard Gauge track was much more prevalent in the UK at that time than the Broad Gauge track (Siddall, 1969). This gauge was declared the Standard Gauge for the United Kingdom.

The Broad Gauge was first introduced in India in 1853. The British East India Company dispatched Mr. F. W. Sims to India to report on the feasibility of introducing railways there. Lord Dalhousie had proposed permitting the introduction of two gauges in the United Kingdom: the Standard Gauge in England and a suitable broader gauge in India. The Broad Gauge (5'-6") seems to have been the brainchild of Mr. F. W. Sims, a consulting engineer. At that time, the Standard Gauge was prevalent in Britain and America, but a gauge wider than the standard gauge (4'-8.5") was proposed by Sims due to the storms and violent winds in India. However, this proved to be incorrect in later years, as no incidents of engines toppling over due to violent winds were reported on smaller gauges like meter-gauge. Nonetheless, the Broad Gauge found its footing during that period (Murthi, 1953).

Prevalent Track Gauges in Different Countries

Various types of gauges exist worldwide, including Broad Gauge (5'-6") measuring 1676 mm, Standard Gauge (4'-8.5") measuring 1435 mm, Meter Gauge, and various Narrow Gauges such as 2'-6" and the Russian Gauge (1520 mm). Broad Gauge is utilized in countries like Pakistan, India, Bangladesh, Sri Lanka, Argentina, and Chile. On the other hand, Standard Gauge is prevalent in Europe, Canada, the USA, the Middle East, China,

Japan, North Africa, Australia, Argentina, and Chile. The percentage of Standard Gauge usage is increasing annually, particularly due to railway expansions led by China, which involve the construction of new routes featuring Standard Gauge tracks. A comparison of the prevalent principal gauges as of the year 2000 is presented in the table below.

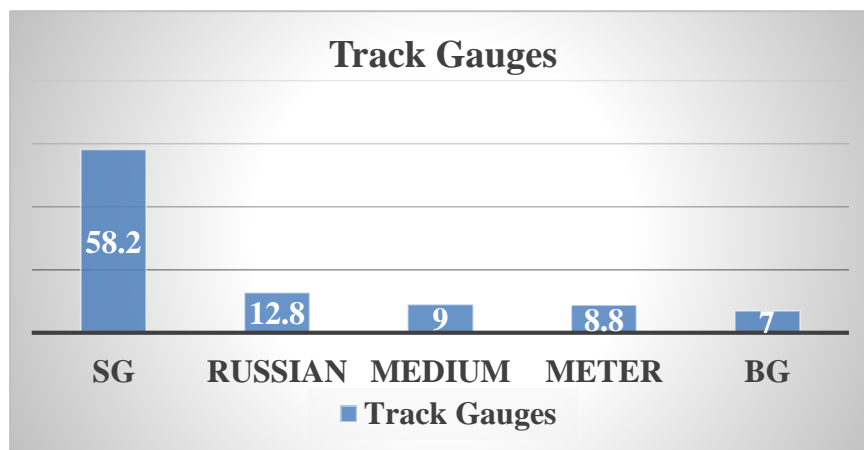
Table 1: Percentage of Principal Track Gauges in the World (Year 2000)

S.N.	Gauge Type	Gauge (ft in)	Gauge (mm)	% age	Countries
1	Standard Gauge	4'-8.5"	1435	58.2	USA, China, EU, Australia, Canada, Japan, Middle East
2	Broad Gauge	5'-6"	1676	7	Pakistan, India, Sri Lanka, Bangladesh
3	Meter Gauge	3.28'	1000	8.8	India, Pakistan, Brazil, Chile, Spain
4	Medium Gauge	3'-6"	1067	9	Australia, Japan, New Zealand
5	Russian Gauge	4'-11 ^{27/32} "	1520 and 1524	12.8	Russia, Central Asia
6	Other Gauges	2'-6", 3', 5'-3"	762, 914, 1600	4.2	China, India, Australia, Ireland

Source: The Standardization of Railway Track Gauge, Douglas J. Puffert, 2001

<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.200.6291&rep=rep1&type=pdf>

Figure 1: Chart showing Percentage of Principal Track Gauges in the World in Year 2000



Source: The Standardization of Railway Track Gauge, Douglas J. Puffert, 2001

<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.200.6291&rep=rep1&type=pdf>

Inter-connectivity of SG and BG Tracks

Interchange arrangements for goods and passenger transit between Broad Gauge and Standard Gauge are essential at junction stations. This involves the dual arrangement of rolling stock. In instances where a railroad network incorporates two gauge systems, such as Broad Gauge and Standard Gauge, it leads to a 'break of gauge,' hindering interconnectivity and necessitating the exchange of rolling stock for the transshipment of goods and passengers. This results in increased time consumption to reach the destination and entails additional costs for operating trains and maintaining track machinery handling two types of rolling stock.

Nevertheless, transshipment in the event of a break of gauge is less daunting today due to the availability of state-of-the-art cranes and machinery. These cranes efficiently transfer containers from one freight train to another within a short duration. However, the break of gauge remains undesirable.

Availability of Locomotives & Rolling Stock for SG and BG

Locomotives and rolling stock for SG tracks are generally available at comparatively lower prices. When it comes to Broad Gauge, there is a common perception that clients need to place special orders with suppliers for BG-based rolling stock. Conversely, with SG, purchasing off-the-shelf from international markets is feasible, although specifications often necessitate custom products. While this holds true to some extent, locomotives and rolling stock are not readily available in the market. These items are manufactured upon special orders, depending on each country's specific custom-based design requirements and dimensions, including the gauges prevalent in that particular railroad network, even for SG. Hence, the cost difference is not significant when comparing the two gauges. Therefore, this criterion alone is insufficient to decide on the introduction of Standard Gauge on the existing network of Pakistan Railways, as conversion costs are not manageable for an economically stressed country like Pakistan (Basharat Waheed, 2022).

Comparative Research and Technology Advancement of SG & BG

Research on Broad Gauge has been conducted extensively in India due to its vast size. However, Pakistan does not benefit similarly due to ongoing tensions between the two nations. Conversely, the majority of advanced technology and research are directed toward Standard Gauge, primarily undertaken in Europe, the USA, and China, where Standard Gauge is prevalent. Furthermore, most countries worldwide have Standard Gauge

tracks.

Comparative Design Parameters of SG and BG

Infrastructural Parameters

Broad Gauge rolling stock exerts less pressure on the sub-grade below and spreads over a wider area in transverse and longitudinal directions due to its wider gauge width compared to Standard Gauge, where the load dispersion is greater. However, the difference in stress induced underneath is not significant when compared with the stress induced in the case of BG for the same axle load.

In the case of Broad Gauge, longer curves are provided, whereas sharper curves can be accommodated with Standard Gauge, thus requiring less land (M Ravindra, 2012). Additionally, 2750 mm length sleepers are laid on BG under the rails, compared to 2600 mm long sleepers in SG track (MD Sleeper Factory, 2022). The shorter length of sleepers is due to the narrower axle width in SG rolling stock, thereby reducing the per kilometer cost of track for SG, especially in hilly or densely populated areas.

Rolling Stock Design Parameters

The utilization of a wider gauge enables the use of wider coaches and wagons, providing increased lateral stability on BG. Conversely, SG requires narrower coaches, which will likely cost less than BG coaches. However, it is important to note that the passenger-carrying capacity of narrower SG coaches will also be reduced. Consequently, more coaches will be required for the same number of passengers. Therefore, when comparing the cost of coaches in both scenarios, it is evident that the cost difference for converting BG track to SG will play a negligible role.

Relative Speed Design Parameter

High-speed trains primarily operate on SG tracks, with a maximum speed of 350 km/h already operational in China on an electrified track between Beijing and Shanghai. After the completion of the ML-1 Track project, a maximum speed of 160 km/h on BG (5'-6") track will be observed on PR. Since BG tracks are predominantly present in Pakistan and India, the technology gap for high-speed trains will be more pronounced if introduced on BG (5'-6") tracks. Speeds on curves on SG tracks in hilly areas or densely populated urban areas will be slightly higher than those on BG tracks, with a nominal difference (M Ravindra, 2012).

Comparative Initial Cost of Construction of SG and BG

The initial expenses for constructing Broad gauge are higher due to the wider rolling stock and infrastructure. Conversely, converting existing Broad-gauge tracks into SG entails significantly higher costs. Generally, it is believed that the construction cost of standard gauge is lower due to its narrower width

compared to broad gauge. This aspect of Standard gauge provides an economic advantage over broad gauge when building new lines. It is understood that standard gauge will necessitate less land acquisition, reduced formation width, and shorter length of sleepers. These gauge features imply lower construction costs compared to broad gauge. However, the impact of construction costs is not substantial when compared with converting BG tracks to SG, so this factor is not compelling for adopting standard gauge on existing lines of the PR network.

Introduction of Standard Gauge in PR and Challenges

Comparative Initial Cost of Construction of SG and BG

The initial expenses for constructing Broad Gauge are higher due to the wider rolling stock and infrastructure. Conversely, converting existing Broad-Gauge tracks into SG entails significantly higher costs. Generally, it is believed that the construction cost of Standard Gauge is lower due to its narrower width compared to Broad Gauge. This aspect of Standard Gauge provides an economic advantage over Broad Gauge when building new lines. Standard Gauge requires less land acquisition, reduced formation width, and shorter length of sleepers. These gauge features imply lower construction costs compared to Broad Gauge. However, the impact of construction costs is not substantial when compared with converting BG tracks to SG, so this factor alone is not compelling for adopting Standard Gauge on existing lines of the PR network.

Introduction of Standard Gauge on ML-1 and Challenges

The ML-1 (Main Line-1 Kemari-Karachi to Peshawar) project of Pakistan Railways is a large project financed by China, where the Broad-Gauge track will be enhanced for a speed of 160 km/h. The PC-1 of Rs. 6.806 billion dollars was sanctioned in August 2020 for the enhancement of 1681 km from Kemari to Peshawar with BG (5'-6") track (Infrastructure Specialist CPEC, 2022). The project has been postponed to date for some undisclosed reasons. Despite the project being approved for BG track after a feasibility study and with input from Chinese and Pakistani railway experts, there are murmurs within PR and sometimes in the media questioning why the ML-1 BG track is not converted to SG.

In this context, the Railway CPEC Ex. Team Leader and Infrastructure Specialist were interviewed. Considering the introduction of Standard Gauge only on ML-1 while other branch lines, ML-2 and ML-3, remain on BG, numerous issues and challenges will be encountered, and minimal advantage will be gained. These are discussed as follows. In the event of converting ML-1 Broad Gauge track to SG from Karachi to Peshawar, transshipment arrangements will need to be provided at all the junction stations on the route. The operational junction stations requiring this facility are listed below.

Table 2: List of Junction Stations on ML-1 Route

S.No.	Junction Station	Branch Line Route
1	Kotri	Kotri -Dadu - Habibkot
2	Hyderabad	Hyderabad - Mirpurkhas, Hyderabad - Badin
3	Rohri	Rohri - Sukkur - Quetta
4	Sammasatta	Sammasatta - Bahawalnagar
5	Lodhran	Lodhran - Pakpattan, Lodhran - Khanewal via Chord
6	Sher Shah	Sher Shah - Kot Addu
7	Khanewal	Khanewal - Shorkot
8	Raiwind	Raiwind - Pakpattan
9	Lahore	Lahore - Wagah
10	Shahdara	Shahdara - Sheikhpura Shahdara - Narowal - Sialkot
11	Wazirabad	Wazirabad - Sangla Hill, Wazirabad - Sialkot - Narowal
12	Lala Musa	Lala Musa - Sargodha
13	Golra Sharif	Golra Sharif - Basal - Kundian
14	Taxila	Taxila - Hevellian
15	Attok City	Attok City - Jund

Source: Chief Operating Superintendent, PR HQ, Official Time Table, 2022

The aforementioned 15 junction stations will necessitate transshipment arrangements, implying dual provision of locomotives and rolling stock, dual gauge setups, and machinery for cargo transshipment handling, which will require substantial finances. Furthermore, all operations will result in significant delays, which are highly undesirable for railway customers as well as all stakeholders. The implementation of the complete ML-1 Project will consume considerable time and will be conducted in various phases to transition the existing BG track to SG. During construction, train operations cannot continue as there will be no provision of dual gauge at stations to facilitate the movement of BG trains. The track at stations will initially be converted to SG, followed by the adjoining block section. The existing BG rolling stock will need to operate on this segment even though the track will have been converted to SG. Even if SG rolling stock is arranged, there will still be portions of BG track that will not accommodate SG rolling stock. The same scenario will be encountered at all work sites. Furthermore, all rolling stock needed for SG track will have to be procured, which will again entail substantial costs. From the foregoing discussion, it is evident that the conversion of the BG ML-1 route to SG track is not financially or operationally feasible.

Introduction of SG Over Entire Railway Network and Challenges

The implementation of Standard Gauge across the entire railway network spanning 11,492 km, including ML-1, ML-2, ML-3, and all other branch lines,

will entail substantial costs. This can be assessed using an approximation method when compared to the already approved PC-1 of the ML-1 Project in August 2020. The estimated cost of the approved ML-1 Project is 6,806 million dollars for a length of 1,681 km of double-line track to be upgraded in 8.5 years (Infrastructure Specialist CPEC, 2022). The cost per km comes to 4.049 million dollars per km. The approximate cost of introducing Standard Gauge on the entire PR network of 11,492 km can be roughly calculated, as shown in Table 2.

Table 3: Rough Cost Estimation of SG on entire PR network

Railway Line	Length (km)	Per km cost Double Line (Million Dollar)	Per km cost Single Line (Million Dollar)	Total Cost (Million Dollar)	Remarks
ML-1	1681 x 2 = 3362	4.049	2.025	6806	8.5 Year time
1 PR lines	11492	-	2.025	23271	25 years' time

Source: Infrastructure Specialist, Railway CPEC Approved PC-1, 2022

Accordingly, the conversion of the entire PR railway network spanning 11,492 km in length will require approximately 23.3 billion dollars, with a timeframe of about 25 years. This cost only covers track conversion; additional expenses for replacing rolling stock and locomotives will also be incurred. Furthermore, all railway workshops and sleeper factory infrastructure will require structural changes. Pakistan is not in a financial position to even contemplate such a massive investment in railways solely for replacing its track gauge from BG to SG. Therefore, the option of converting the entire broad-gauge network to standard gauge is not technically, operationally, or financially feasible.

Introduction of SG on Interconnections with Neighboring Countries

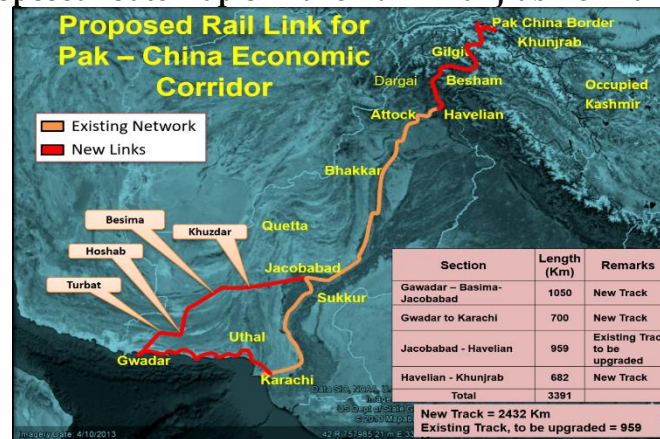
Rail transport is deemed cost-effective and an efficient means of transporting large cargo over extended distances. Numerous countries have bolstered railway connectivity, making it an integral component of economic corridors within their regions. South Asia, often regarded as one of the least integrated regions globally, has lagged behind other regions in terms of railway connectivity. The geography of Pakistan presents a uniquely advantageous position, with Gwadar Port, Karachi Port, and Port Qasim situated on the Arabian Sea in the south, India to the east, China emerging as a global superpower to the north, Iran to the southwest, and Afghanistan to the northwest. Afghanistan, a landlocked country, is further linked with Central Asian landlocked states abundant in natural resources. This confluence renders Pakistan a pivotal country in the region, as distances can be shortened through railway connections with China and Afghanistan, extending up to Central Asia and Russia. Through these interconnections, Pakistan has the

potential to emerge as a hub of international trade and transportation.

Interconnection with China

Pakistan currently lacks a rail link with China. Pakistan Railways' track in the north is operational up to Havellian, which is connected 55 km away with ML-1 at Taxila Junction on the Karachi-Peshawar line. A new track spanning about 682 km is set to be constructed from Havellian to Khunjerab. This track will traverse through challenging mountainous terrain, necessitating the construction of numerous tunnels, curves, and bridges. Meanwhile, China has a standard gauge track up to Kashgar on its side. Consequently, the track from Havellian to Khunjerab is proposed to be constructed as SG, given its isolated nature with minimal impact on the BG network of PR and considering the lower construction costs involved for SG curves, tunnels, and bridges to be built by Pakistan. Moreover, the primary traffic beyond Havellian will be related to China, making SG the most suitable option, as China plans to construct about 350 km of track on its side from Khunjerab to Kashgar as SG track. Transshipment facilities need to be developed at Havellian since Pakistan has a Broad Gauge track up to Havellian. A dry port is proposed at Havellian in the Railway CPEC framework with transshipment arrangements (Basharat Waheed, 2022).

Figure 2: Proposed route map of Havellian-Khunjerab new railway track



Source: PR, Chief Engineer S&C HQ office, Lahore, 2015

Since the track from Havellian to Khunjerab is to be newly laid and isolated from the rest of the country, it will encounter fewer issues regarding transshipment due to China's advanced machinery and equipment at the dry port. As China has SG on its side, the break of gauge is inevitable in this case; thus, the introduction of Standard Gauge from Havellian to Khunjerab is feasible. Dual gauge and transshipment facilities are to be provided at the Havellian dry port. Figure 1 above illustrates the proposed new track alignment of the Gwadar-Jacobabad and Havellian-Khunjerab route, which will further extend up to Kashgar in the Xinjiang province of China.

Interconnection with India

Pakistan has railway connections with India at Wagah and Zero Point station near Khokhrapar. Broad Gauge track exists on both sides of the border at Wagah-Atari and Khokhrapar-Zero Point-Monabao sections. Pakistan had operational goods and passenger trains on these sections until August 2019, when services were suspended in protest after the Indian Government revoked Articles 370 and 35A related to Kashmir. However, these services may need to be restored in the future. Additionally, Sikh special trains operated in 2022 on the section, coming from India to facilitate Indian Sikh yatis visiting Nankana Sahib and Hassan Abdal. Indian Railways adopted a uni-gauge policy in 1990, opting for Broad Gauge for its entire network (M Ravindra, 2012). Consequently, all railway lines that were on other gauges are being gradually converted to Broad Gauge by Indian Railways.

No country has changed its prevailing gauge to Standard Gauge in recent years due to the high financial costs involved. Thus, introducing SG on cross-border tracks with India is not viable, as transshipment of goods and passengers would be required for a short distance of 24 km from Wagah to Lahore, and Zero Point Marvi station is 200 km from Hyderabad. Given the significant financial implications and India's broad gauge policy, introducing SG on cross-border tracks with India is not recommended.

Interconnection with Iran

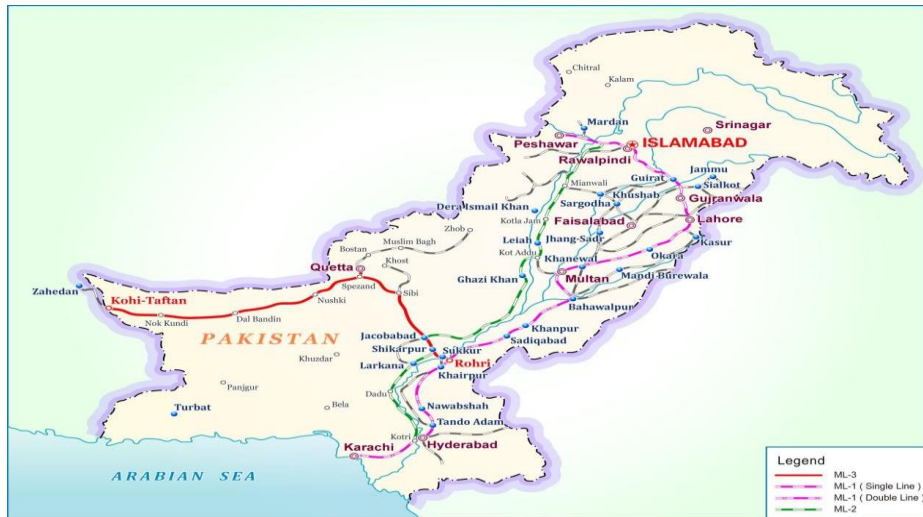
Pakistan has a Broad Gauge track at the interconnection station of Kohe-Taftan on the Iran border. The track from Kohe-e-Taftan to Zahedan, which is 95 km long and within Iranian territory, is laid in Broad Gauge. This arrangement resulted from an agreement between Pakistan Railways and Iranian Railways in 1959. The Broad Gauge track from Taftan to Zahedan is jointly maintained by Pakistan Railways and the Iranian side. Maintenance labor is provided by Iran, but the BG track material is supplied by Pakistan Railways because Iran only has Standard Gauge facilities, and any rolling stock, material, or machinery related to BG is provided by Pakistan Railways. Dual Gauge arrangements are available at Zahedan, accommodating both BG and SG (Kashif, 2022).

The Islamabad-Tehran-Istanbul (ITI) train runs to this border, where transshipment occurs to shift to SG track on the Iranian side at Zahedan. The ITI Cargo Train can cover a distance of 1,990 km in Pakistan, 2,600 km in Iran, and 1,950 km in Turkey in 14 days. In Turkey, the railway tracks are Standard Gauge. Turkish Railways send its rolling stock (carriages and wagons) to Zahedan, which then picks up the cargo from the arriving rolling stock of Pakistan Railways.

The rehabilitation/upgrading of the existing Quetta-Taftan section for higher speeds and axle loads has become necessary to make this section commercially viable and competitive with road transport. It is also essential for serving as a viable passenger and freight line and for providing access to

Europe via Iran and Turkey. Pakistan Railways conducted a feasibility study for the upgrading of this section, carried out by the Chinese firm Siyuan in 2019. The final technical recommendation of the feasibility report is to upgrade this section as a single-line Broad Gauge (1676 mm) track with a 25-ton axle load and a maximum speed of 120 km/h, except from Glangur to Nushki, where a speed of 80 km/h is recommended (Chief Engineer S&C, PR, 2019).

Figure 3: Map of Pakistan Railway ML-3 Rohri-Taftan Section



Source: PR HQ Chief Engineer S&C, Feasibility study of Quetta Taftan 2019

Introducing Standard Gauge on this section on the Iranian border side up to Zahedan and on the Pakistan side is not advisable solely for the ITI train, as this would shift the break of gauge to Quetta or Spezand due to Broad Gauge tracks extending all the way to Islamabad. Consequently, Pakistan Railways would need to implement dual gauge, dual stock, and transshipment arrangements, which are unavoidable due to the different gauges prevalent in both countries.

Interconnection with Afghanistan

Currently, there is no railway link between Pakistan and Afghanistan. However, Pakistan could potentially establish connections with Afghanistan from two sides: the Quetta-Chaman route up to Kandahar and the Peshawar route up to Jalalabad-Kabul. This would facilitate the linkage of Central Asian states and Russia to warm waters through Gwadar, fulfilling a longstanding regional aspiration if realized.

The 11 member countries of the Central Asian Regional Economic Cooperation (CAREC) recognize the importance of railways in completing this multimodal corridor network. Pakistan also endorsed "The Railway Strategy for CAREC, 2017-30" at the CAREC ministerial conference held in Islamabad on October 26, 2016 (CAREC Secretariat, 2017). The vision behind

the CAREC railway strategy is to make rail transport the preferred mode for trade: quick, efficient, and easy to use throughout the region. The development of effective rail infrastructure aims to address gaps and missing links along designated rail corridors (DRCs), most of which pass through Afghanistan and then Pakistan to reach the warm waters of the Arabian Sea, as depicted in Figure 4 below

Figure 4: CAREC Designated Rail Corridors



Source: CAREC Railway Strategy 2017-30, CAREC Secretariat
www.carecprogram.org

Considering the above, the significance of the railway link between Pakistan and Afghanistan is evident. However, the decision regarding the gauge on the Jalalabad and Kandahar sides is complex, as Afghanistan has not clarified its national gauge due to the intricate situation surrounding rail gauges. Afghanistan uses the Russian gauge (1520 mm) for its connections to Central Asian neighbors, namely Turkmenistan, Uzbekistan, and Tajikistan. The gauge on the China and Iran sides is SG, while Broad Gauge is used in Pakistan. Given this situation, it is essential for Afghanistan to address gauge breaks, whether it opts for the Russian Gauge, SG, or BG. The decision regarding the gauge on the two interconnections with Pakistan will depend on the gauge chosen by Afghanistan, considering the designated rail corridors (DRCs) of CAREC. However, it can be stated that Afghanistan cannot avoid the break of gauge, so Pakistan may propose BG for both routes up to its borders: the Peshawar-Jalalabad route (145 km) and the Chaman-Kandahar route (107 km). Transshipment arrangements should then be organized near the Afghanistan borders.

Conclusion

Considering the above comparative analysis, issues, and challenges discussed in Sections 1 and 2, it is concluded that converting the entire existing network of Broad Gauge (5'-6") track to Standard Gauge is not a viable option for Pakistan Railways, either now or in the future, as it involves prohibitive

financial costs and train operations would cease during the construction period. Although the break of gauge is undesirable, it is unavoidable for regional connectivity with neighboring countries that use different gauges. Standard gauge can only be introduced on isolated networks or newly constructed alignments, especially in hilly terrain or cross-border track areas where the break of gauge is unavoidable. The cost of converting existing BG to SG track is indeed very high, but for new lines, particularly in hilly terrain, the cost of SG track is lower. However, this difference is not significant enough to justify opting for multi-gauge within the country based solely on cost. Standard Gauge is named as such, but this does not imply that BG (5'-6"), Meter gauge, or Russian Gauge is non-standard. Each gauge has its own significance and has been historically adopted in different countries for strategic, financial, or various other reasons. Therefore, Pakistan Railways must adhere to Broad Gauge as the national gauge.

Recommendations

Based on the aforementioned research, several recommendations are proposed for Pakistan Railways and the Government, outlined as follows:

The current BG track of Pakistan Railways should not be converted to SG, even in the future.

It is recommended to build a new railway line from Havellian to Khunjerab in challenging hilly terrain as a Standard Gauge track. This choice is prompted by the inevitable gauge break at the border with China, given that China operates SG track on its Kashgar line.

The proposed new track connections with Afghanistan should be constructed on BG on the Pakistan side, along the Peshawar-Jalalabad route and the Quetta-Chaman-Kandahar route. This recommendation stems from the unclear future gauge policy of Afghanistan, due to the complex situation of different gauges on its borders. Nevertheless, following the determination of Afghanistan's national gauge, this recommendation should be reassessed accordingly.

It is proposed to upgrade the track from Quetta to Taftan on the existing BG track, considering the unavoidable gauge difference with Iran. Hence, relocating transshipment to Pakistan or adopting multi-gauge on the Pakistani side is operationally and economically undesirable.

It is strongly advised that Pakistan Railways establish its own workshops for the local production of rolling stock and locomotives. Prioritizing technology transfer in future international procurements is crucial to prevent dependency on the international market and conserve significant foreign exchange.

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Exploring the Potential and Challenges of Ai and Blockchain Integration for Revenue Enhancement in Pakistan: A Comprehensive Policy Analysis

Immad Alam¹

Dr. Muqem-ul-Islam²

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Abstract:

The efficiency of Pakistan's tax system is currently hindered by a low tax-to-GDP ratio and persistent fiscal deficits, exacerbating the country's reliance on external borrowing. Recent advancements in Artificial Intelligence (AI) and blockchain technology present an opportunity to enhance revenue generation and streamline tax administration. This paper explores the transformative potential of integrating these technologies into Pakistan's tax system, identifying both the benefits and the challenges associated with their adoption. Key challenges include the need for substantial infrastructure investment, concerns over data privacy, and the necessity for a supportive legal framework. The paper recommends several policy actions, including the establishment of a regulatory framework for AI and blockchain, legal amendments to support these technologies, and the development of robust IT infrastructure and digital identity systems. Addressing these recommendations will be crucial for modernizing Pakistan's tax administration and improving compliance, ultimately helping to break the cycle of debt and foster economic growth.

Key words:

Tax Administration, Artificial Intelligence, Blockchain Technology, Revenue Generation, Legal Framework

¹ Currently posted as Deputy Commissioner, Regional Tax Office (RTO), Peshawar

² Faculty Advisor

Introduction

Taxation forms an indispensable pillar of a nation's financial framework, levied either directly or indirectly on individuals for the services rendered by the government or its agencies. Primarily aimed at funding public expenditure, the bulk of government revenue is derived from taxes. Moreover, the tax system serves as a crucial instrument in pursuing various objectives, such as equity and fostering social and economic progress within an economy. A meticulously designed tax system is thus one of the fundamental requirements for enhancing GDP growth (Shehzad & Maqbool, 2018).

To assess the performance of revenue collection in an economy, the tax-to-GDP ratio serves as a robust and inclusive measure. Pakistan's tax-to-GDP ratio stands at 9.75 percent, notably lower compared to other Asian economies. Nepal reports a ratio of 19.9%, Taiwan 15.1%, Singapore 15%, and Sri Lanka 12.3% (Shehzad & Maqbool, 2018).

The poor performance of tax revenue generation in Pakistan leads to persistent fiscal deficits, which force the government to explore other options like borrowing from banks or international donors to meet its budgetary demands. This, in turn, leads to a high debt servicing burden on the Federal Government (World Bank, 2023).

Hence, Pakistan finds itself trapped in a perpetual cycle of debt. However, with the introduction of new technological tools such as Artificial Intelligence (AI) and Blockchain, there is an opportunity for developing countries like Pakistan to enhance revenue generation from taxes by utilizing these tools.

Pakistan is no different when it comes to utilizing these tools for revenue generation, and hence it needs to adopt international best practices in this area to enhance its revenue generation potential.

However, the implementation of such technologies presents challenges. Integrating AI and blockchain into existing tax systems demands substantial investment in infrastructure and training. Furthermore, concerns surrounding data privacy and the security of taxpayer information in the digital sphere are paramount. Tax authorities in Pakistan must navigate these challenges cautiously to ensure successful technology adoption. Despite existing challenges, the potential benefits of these technologies in streamlining tax processes, improving compliance, and safeguarding data integrity are substantial. Embracing these digital tools will be crucial as tax administrations continue to evolve, shaping the future of tax compliance and administration (Adelekan & Adisa, 2024).

Statement of the Problem

Despite repeated efforts by the government, Pakistan has not been able to

increase its tax-to-GDP ratio. However, with advancements in AI and blockchain technology, along with Pakistan's recent draft National Artificial Intelligence Policy, the country has been presented with an opportunity to enhance its revenue generation. This situation calls for a study to undertake thorough research on how AI and blockchain can be integrated into Pakistan's tax system to achieve the full tax potential of Pakistan's economy.

Research Questions

Q1. What are the main challenges in adopting AI and blockchain for tax revenue enhancement in Pakistan?

Q2. What policy and investment measures are needed to integrate AI and blockchain into Pakistan's tax system?

Scope of study

The study will review the literature on the use of AI and blockchain for revenue generation by tax authorities and analyze the current situation of tax automation in Pakistan. It will also examine the Draft National Artificial Intelligence Policy and identify gaps in Pakistan's prevailing legal, institutional, and policy framework concerning the integration of AI and blockchain with tax administration.

Literature review

The integration of AI and blockchain technology into tax administration is motivated by the necessity for enhanced efficiency, security, and transparency in tax systems. This integration addresses numerous challenges faced by both tax administrations and taxpayers, presenting innovative solutions for managing compliance. Previous research has comprehensively dealt with this issue.

AI's transformative role in tax administration is evident in its ability to analyze large volumes of tax data. This capability enables more effective risk assessment and fraud detection, improving the accuracy of tax assessments and aiding in proactive tax evasion prevention. Conversely, blockchain's immutable characteristic offers a sturdy foundation for documenting transactions, consequently diminishing the likelihood of fraud and strengthening the integrity of tax systems. These digital tools have prompted a shift in the organizational structure and business processes within tax administrations (Adelekan & Adisa, 2024).

In developing economies like Pakistan, the conventional tax system has encountered numerous hurdles, including inadequate tax collection, a lack of precise tax data, deficient record-keeping, intricate payment procedures, and elevated expenses associated with tax compliance. These challenges frequently lead to substantial tax revenue losses and inefficiencies in tax

administration (Amarachi & Nwambe, 2019).

Blockchain technology, when utilized in tax law and administration, presents an innovative approach to managing tax-related data and transactions. Lyutova and Fialkovskaya (2021) delve into the application of blockchain in tax matters, particularly within the realm of digital financial assets and tax oversight. Their study emphasizes the effectiveness of blockchain in tax and legal frameworks, highlighting its potential to improve tax processes.

Rainero and Modarelli (2021) offer a conceptual examination of blockchain's involvement in public administrative procedures, with a particular emphasis on its potential within the public sector. Their study underscores the diverse applications of blockchain in public management, presenting a framework that integrates its primary functions and future prospects. This conceptual framework demonstrates the potential for blockchain to revolutionize administrative processes, highlighting an approach centered around citizens that promotes transparency and accountability.

Blockchain technology introduces new administrative prospects in taxation. Its integration can result in more organized data, cost savings, secure frameworks (including fraud detection), and a decentralized transactions database. Leveraging smart contracts within blockchain frameworks can automate payments, transfers, and asset accounting, ultimately reducing transaction costs and fostering more efficient taxation operations (Grundel & Zhuravleva, 2021).

The decentralized and immutable characteristics of blockchain technology render it an ideal tool for securing tax data, ensuring the integrity and reliability of tax records (Kim, 2022). Blockchain has the potential to substantially enhance the distribution and security of tax data, streamlining the submission and processing of tax invoices while making them more traceable (Ashfaq & Iftikhar, 2022).

The amalgamation of AI and blockchain technologies in tax administration signifies a notable transition towards increasingly data-driven and automated systems. AI's proficiency in data analysis and pattern recognition synergizes with blockchain's secure and immutable record-keeping, resulting in a combined effect that boosts the precision and dependability of tax processes (Adelekan & Adisa, 2024).

Research Methodology

The study employs a qualitative approach, focusing on the interpretation and synthesis of existing literature to derive conclusions regarding the current status and potential use of AI and blockchain in tax administration in Pakistan to enhance its revenue. This method enables a comprehensive understanding of intricate issues and facilitates the formulation of informed recommendations.

Organization of the Paper

The paper is divided into three sections. Section I presents a general analysis of AI and blockchain and their impact on enhancing tax revenue. Section II provides a situational analysis of the legal and institutional framework for revenue generation in Pakistan, along with a gap analysis of the FBR's IRIS software system. Section III offers a critical analysis of Pakistan's Draft National Artificial Intelligence Policy, a risk analysis of adopting AI and blockchain for revenue generation in Pakistan, and a gap analysis of Pakistan's legal and organizational framework concerning the adoption of AI and blockchain in revenue generation.

Analysis of AI and Blockchain for Enhancement of Revenue

What is AI and Blockchain

"Artificial Intelligence (AI) refers to the simulation of human intelligence in machines, specifically computer systems, that are programmed to perform tasks that typically require human intelligence, such as learning, problem-solving, and decision-making. These systems are designed to analyze vast amounts of data, recognize patterns, and adapt to new information, enabling them to perform tasks autonomously without explicit programming" (Russell & Norvig, 2021).

"Blockchain is a distributed ledger technology that enables secure and transparent peer-to-peer transactions without the need for intermediaries. It consists of a chain of blocks, each containing a record of transactions that is cryptographically linked to the previous block, forming an immutable and tamper-resistant database. Blockchain technology ensures data integrity, decentralization, and consensus among participants in the network" (Narayanan, 2016).

Analysis of Impact of AI and Blockchain on Revenue Enhancement and Tax Compliance

Improving Tax Compliance Through Adoption of Blockchain

The fundamental reason behind embracing blockchain technology in tax compliance stems from its capacity to decentralize and authenticate tax procedures. The concept of 'tax compliance by design,' wherein blockchain technology is employed to ensure compliance in business operations, particularly concerning value-added taxes, has been explored in earlier research. This method capitalizes on blockchain's inherent attributes, such as transparency and immutability, to establish a more dependable and effective tax compliance environment. By incorporating compliance into the framework of business processes, blockchain technology has the potential to notably simplify the complexity and reduce the costs associated with tax compliance (Fatz, 2019).

Empirical studies provide additional evidence of the influence of blockchain on taxpayer compliance. One study from 2022 illustrates how blockchain technology can efficiently tackle non-cooperative behavior and narrow the tax gap. Through research employing panel data models and agent-based simulations, it has been shown that integrating blockchain enhances the operational effectiveness of tax administrations such as the Internal Revenue Service (IRS) and reinforces enforcement mechanisms. This leads to heightened compliance rates and fewer occurrences of tax evasion (Alexander, 2022).

Enhancing Revenue Collection Through Blockchain

Blockchain technology can enhance revenue levels and improve compliance tracking through its security, immutability, and real-time information capabilities. This may result in decreased tax evasion and fraud, with taxpayers experiencing reduced compliance expenses and improved experiences through more streamlined processes (Nascimento, Da Silva, & Peres, 2021).

Improving the Effectiveness, Efficiency, and Security of Tax Systems Through Adoption of Blockchain

Blockchain technology holds promise for enhancing the tax administration system. Governments can use it for (i) digitizing key elements of tax administration, (ii) securely capturing and disseminating a substantial volume of authenticated, reliable, and high-quality tax-related data among authorized stakeholders, (iii) granting taxpayers and tax authorities immediate access to tax records and documentation, and (iv) automating specific tax procedures and computations (Sulami, 2022).

Using AI and Blockchain for Predictive Analytics

The fusion of AI and blockchain technologies presents the opportunity for predictive analytics in tax administration. This capability empowers tax authorities to forecast future trends and patterns in tax compliance, facilitating proactive and strategic planning. Nonetheless, harnessing these advantages necessitates tackling challenges associated with implementing and integrating these technologies into current tax systems. Concerns such as infrastructure development, skill augmentation, and policy formulation need to be meticulously addressed to ensure the effective adoption of AI and blockchain in tax administration (Adelekan & Adisa, 2024).

Institutional and Legal Framework for Revenue Generation in Pakistan and Gap Analysis of FBR's Automation Software

Institutional and Legal Framework for Revenue Generation in Pakistan

In Pakistan, taxes are collected both at the federal and provincial levels. The details of taxes collected at various levels and the bodies responsible for the

collection of those taxes are given below.

a) Taxes at the Federal Level

At the federal level in Pakistan, the major taxes are:

Income Tax

Income tax is a direct tax imposed on the 'taxable income' of individuals, businesses, and other entities by the government of Pakistan. It is a key source of revenue for the government and is used to fund various public services and projects. The collecting agency for income tax is the Inland Revenue Service (IRS), which is a wing of the Federal Board of Revenue (FBR). Income tax is regulated through the Income Tax Ordinance, 2001.

Sales Tax on Goods

Sales tax is payable on the supply of goods at the rate of 18%. For certain retail items, it is collected from the manufacturers of the goods (e.g., on beverages). In Islamabad, sales tax on services is also collected at the federal level by the Federal Board of Revenue (FBR). Import of goods by commercial importers is also subject to sales tax at 3%, in addition to the original sales tax payable at 18%. The collecting agency for sales tax on goods is the Inland Revenue Service (IRS), which is a wing of the FBR. Sales tax on goods is regulated through the Sales Tax Act, 1990.

Federal Excise Duty (FED)

FED is imposed on specific categories of excisable goods and services at different rates. Regarding FED on services, it is limited to the Islamabad Capital Territory. However, on goods, it is collected throughout Pakistan. The collecting agency is the Inland Revenue Service, which is a wing of the Federal Board of Revenue (FBR). FED is regulated through the Federal Excise Act, 2005.

Customs and Imports Duty

At the import stage, customs duties and certain other fees are collected at different rates, categorized according to the Harmonized System (HS) Code. The collecting agency is Pakistan Customs, which is a wing of the FBR. Customs duty is regulated through the Customs Act, 1969.

The share of FBR (Federal) and Provincial Tax Authorities (Provincial) in the total collection of revenue is given in Table 1 below.

	FY2023 B. E	July-March		Growth
		FY2023	FY2022	
A. Total Revenue	10,370.0	6,938.2	5,874.2	18.1
% of GDP	13.3	8.2	8.8	-
a) Tax Revenue	8,260.0	5,617.7	4,821.9	16.5
% of GDP	10.6	6.6	7.2	-
Federal (FBR Taxes)	7,470.0	5,155.9	4,383.6	17.6
% of GDP	9.6	6.1	6.6	-
Provincial Tax Revenue	790.0	461.8	438.3	5.4
b) Non-Tax Revenue	2,110.0	1,320.5	1,052.2	25.5
% of GDP	2.7	1.6	1.6	-

Source: Economic Survey of Pakistan 2022-23

As evident from the above table, the FBR is responsible for the collection of almost 90% of the revenue from taxes in Pakistan.

b) Taxes at the Provincial Level

Sales Tax on Services

This tax is levied by the provinces. After the promulgation of the 18th Amendment, the collection of sales tax on services was devolved to the provinces, and now each province has its own revenue collection authority to collect this tax. Every province has promulgated its own Sales Tax Rules and Regulations to regulate the imposition and collection of these taxes.

Excise, Professional, and Property Taxes

These taxes are collected by the provinces through municipal governments, excise and taxation departments, and other bodies.

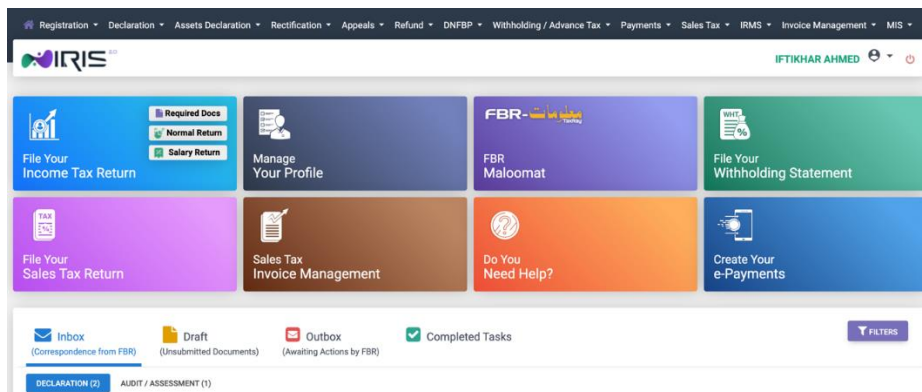
Present Scenario of Database Management, Automation, and IT Systems at FBR

The introduction of electronic tax systems, commonly known as e-tax, marks a transformative step in addressing challenges to taxation. E-tax systems present a more streamlined and user-friendly approach to tax administration, simplifying compliance for taxpayers and enabling more efficient collection for tax authorities. Research has demonstrated that the adoption of e-tax systems substantially enhances tax revenue collection, improves the accessibility and precision of tax records, and diminishes the overall expenses associated with tax compliance (Amarachi & Nwambe, 2019).

Pakistan has also launched a similar digital platform called the Inland Revenue Information System (IRIS) to allow taxpayers to file their tax returns as well as fulfill any other legal requirements under the Federal Tax Laws of Pakistan. The system was launched in 2014 as a comprehensive database management system to automate the filing of federal taxes in Pakistan.

Inland Revenue Information System (IRIS)

Figure: I IRIS Dashboard



Source: FBR

IRIS was introduced in 2014 to replace the legacy Income Tax Management System (ITMS), which was the first computerized database management system of the FBR with only partial automation. ITMS only allowed the filing of returns and maintenance of the taxpayers' returns database. However, IRIS provides a comprehensive database solution which includes:

- Online filing of tax returns, applications for refunds, replying to notices, and covering all the taxpayer-side provisions given in the Income Tax Ordinance, 2001, and Sales Tax Act, 1990.
- Issuance of electronic notices to taxpayers for both Income and Sales Tax.
- Seeking online replies from taxpayers in response to notices issued by the tax authority.
- Issuance of bar-coded tax exemption certificates.
- Maintenance of complete taxpayer records, i.e., registration information, returns filed, tax payments, pending audits, all previous notices and orders issued in a case, outstanding tax demands, tax deducted by employers and other agencies like banks, property transfer authorities, excise and taxation departments, etc.

IRIS is therefore a complete centralized database solution employed by the FBR to maintain its taxpayer records. Although the FBR has been largely successful in digitizing its records and moving from a traditional paper-based system to an online computer-based system, the notices issued by officers, scrutiny of taxpayer online replies, and record-keeping, along with audits of taxpayers, still require significant human intervention. The system needs to be operated by officers who have to keep track of all the cases in their respective jurisdictions by regularly checking their accounts for updates from taxpayers.

However, AI, with its computational ability, can be leveraged to revolutionize tax processes and enhance tax effectiveness and transparency by implementing data-driven tax administration, streamlining repetitive tax duties, bolstering efforts against tax evasion, and enhancing taxpayer services through automation and AI technologies (Serrano Anton, 2022).

Gap Analysis of IRIS vis-à-vis Integration with AI

In this section, a gap analysis is performed by comparing the current state of IRIS with a desired state in which AI is integrated into the system to implement a data-driven tax administration and where repetitive tasks are completely automated through AI without human intervention.

Sr No	Current State	Action Plan	Desired State
1	Taxpayer assistance is provided through phone helpline	Integration of AI powered chatbot in IRIS	Provision of immediate assistance to taxpayers for clarifications and guidance on tax filing and resolution of complaints
2	Data in tax returns is manually entered by the users	Use of AI to recognize taxpayer data from different sources using CNIC number and generate a draft amendable return for the taxpayer	Tax returns are generated automatically by utilizing already available user data from other sources such as employers, banks and property transactions etc.
3	Notices to taxpayers are issued on a case to case basis through human intervention	Training AI module to calculate the due date of filing of returns and issue notices in bulk to all the non-filers along with follow-up notices and imposition of fines as per the tax laws	Automatic generation of notices to taxpayers once the due date of return filing is lapsed
4	Tax payer audit is manually conducted by going through voluminous record and checking compliance with tax laws	Development of an AI Module in IRIS which can be trained to analyze taxpayer record and calculate the tax default based on violations of tax laws	Automatic generation of show cause notices to taxpayers based on violation of tax laws
5	No provision of personalized messages to taxpayers for enhancing	Utilization of behavioral economics principles using AI to compute	Personalized and tailored nudging and reminders to inform taxpayers about their national duty as well

	compliance and promotion of tax filing culture	tax liabilities and amount of fine and penalties for dissemination to the taxpayers	as consequences of non-filing such as fine and default surcharge
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Critical Analysis of Draft National Artificial Intelligence Policy

In May 2023, the Ministry of Information Technology & Telecommunication (MoITT) of Pakistan released a consultative draft of the nation's inaugural National Artificial Intelligence Policy. Additionally, the Ministry announced plans to establish a Policy Committee tasked with gathering input from various stakeholders, including academia, industry, and government officials. Following this consultation process, the draft is expected to undergo finalization.

The draft policy, however, exhibits five key overarching flaws:

Lack of a Comprehensive National Approach to AI:

The draft should have been formulated through inclusive, multi-stakeholder consultations involving industry and academia, facilitating the development of a unified strategy for AI. This inclusive approach should have preceded the drafting process, which instead relied on exclusive coordination with selected consultants.

Administrative Resistance/Capacity Issues to Digitalization:

Addressing this ingrained issue necessitates stringent political oversight from both federal and provincial governments working collaboratively. Additionally, preparations should commence for the gradual phasing out of traditional administrative roles if the state genuinely aims to embrace AI effectively. Currently, the adoption of AI tools, especially in governance and the public sector, is extremely difficult due to a lack of training for officers and officials as well as a significant knowledge gap.

Internet Accessibility and Connectivity:

AI and blockchain technologies are dependent on the internet. However, in Pakistan, outages and censorship from the state due to security and other reasons are regularly encountered. The policy is silent on this critical issue of internet access and censorship in Pakistan and does not provide a mechanism for safeguarding AI and blockchain-backed processes in official circles.

Futility of Setting Arbitrary Goals:

Integrating AI into routine departmental tasks should be avoided due to the dynamic and evolving nature of AI intricacies and protocols. While it is acceptable to articulate ambitions and aspirations, imposing rigid deadlines

or cut-off dates is impractical in a country like Pakistan, where awareness of AI remains limited. Such unrealistic deadlines may inadvertently encourage shortcuts to achieve objectives, leading to quality control issues and other shortcomings.

Fragmented Approach to AI Research and Development:

Achieving an integrated and holistic approach to AI necessitates synergy, which can be achieved through the appointment of a National Coordinator (or similar authority) operating autonomously. This office should operate with minimal resources, solely focused on coordinating efforts among existing channels, rather than establishing new bureaucratic layers that could further complicate the process.

Risk Analysis of Introducing AI and Blockchain in Revenue Generation

The incorporation of advanced technologies like Artificial Intelligence (AI) and blockchain into tax systems introduces a multitude of challenges spanning technical, infrastructural, legal, and operational domains. Pakistan is no different. Addressing these challenges is crucial to ensure the effective integration and optimal performance of these technologies in tax administration.

Technical and Infrastructure Risks:

One of the primary hurdles lies in technical and infrastructural limitations. Integrating AI into tax systems, especially in areas like tax collection and administration, necessitates a robust technological infrastructure comprising advanced computing resources, data storage capabilities, and a skilled technical workforce. Such requirements may pose significant obstacles, particularly for tax administrations in developing countries where resources are limited (Li, 2022).

Data Privacy and Security:

In addition to technical concerns, data privacy and security are key issues. The deployment of AI and blockchain technologies raises fundamental questions regarding the protection and confidentiality of sensitive taxpayer information. Upholding data privacy and adhering to stringent data protection regulations are essential aspects of implementing these technologies in tax systems. This underscores the need for rigorous security protocols and compliance with legal standards to safeguard taxpayer data (Adelekan & Adisa, 2024).

Legal and Regulatory Framework:

The evolving legal and regulatory frameworks surrounding AI and blockchain use in tax systems add another layer of complexity (Bobek, Ghosh,

& Horvat, 2021). In the context of Pakistan, there is currently no regulatory framework for the use of AI and blockchain in revenue generation. There is a need for clear, comprehensive legal frameworks governing the application of these technologies. This includes regulations on data usage, AI decision-making processes, and the legal status of blockchain transactions. Developing and continuously updating these frameworks are crucial for ensuring the lawful and ethical use of AI and blockchain in tax systems.

Integration of New Technology with Legacy Systems:

Integrating AI and blockchain technologies with existing tax systems poses another critical challenge. Ensuring compatibility and seamless integration with legacy systems such as IRIS is vital to prevent disruptions in tax administration processes. This necessitates meticulous planning, testing, and phased implementation strategies to ensure smooth integration.

Skills Gap

Addressing skill gaps and training needs is essential for the effective utilization of AI and blockchain by tax authorities. Developing expertise in these technologies is crucial for their successful implementation and management. This involves not only training tax officials and IT personnel but also ensuring ongoing learning and adaptation as these technologies evolve (Fernando & Sepliana, 2019).

High Cost of Implementation

The cost implications of implementing AI and blockchain technologies cannot be underestimated. The financial aspects, including investments in hardware, software, and human resources, can be significant, particularly for tax administrations operating in resource-constrained environments. Balancing costs with potential long-term benefits is a critical consideration in the decision-making process (Adelekan & Adisa, 2024).

Digitization of Economy

To utilize AI tools and implement blockchain for the management of databases, it is imperative that there be availability of digital records that can be interpreted by AI tools or stored in the form of blockchain. However, in Pakistan, most transactions still take place in cash and are not digitized. The cash in circulation in Pakistan by the end of June 2023 was 30% of the total money supply in Pakistan (Raza, Sultan, & Zafar, 2023). This poses a serious threat to the viability of AI and blockchain tools in tax administration in Pakistan.

Removal of Bias

AI also poses a potential risk of introducing bias in tax analyses, which needs

to be regulated by studying international best practices and adopting global standards of algorithm development for tax analysis by AI tools (Gavoor & Raffi, 2021).

Gap Analysis of Legal and Organizational Framework of Pakistan in Utilizing AI and Blockchain

Considering Pakistan’s legal and organizational framework in relation to tax collection and the use of AI and blockchain, the following gaps have been identified that need to be addressed to enable tax authorities to adopt these technologies for improving revenue generation.

Sr No	Current State	Action Plan	Desired State
1	No Legal Framework to regulate the validity of the use of this technology within the taxation authority	Drafting of Laws for regulation of use of AI and Blockchain in public sector as well as revenue authorities and bodies	A comprehensive regulatory framework that allows the use of blockchain and AI in tax regulation in Pakistan
2	Un-availability of infrastructure including hardware, software and IT capabilities with the FBR	Provision of relevant IT infrastructure to FBR	Availability of IT infrastructure to utilize AI and Blockchain technology for tax compliance and revenue generation
3	Lack of trained staff to utilize AI and Blockchain Technology by FBR	Training of staff as well as hiring of fresh IT graduates to meet the knowledge gap	Well trained staff with good understanding of using AI and Blockchain technology
4	Lack of a digital identity to make transactions that are on the blockchain network	Development of digital identities for staff of tax authorities so that they can access the blockchain networks and become a valid node in the network	Presence of digital identities for staff of tax authorities who can make transaction on blockchain
5	No policy that can minimize the risks inherent in blockchain and AI technology	Development of a regulatory framework in consultation with all the stakeholders	Presence of a policy that regulates the use of AI and blockchain in public services and that minimizes the risks by mandating ethical use of these technologies in public domain
6	Pakistan is still predominantly a	Digitization of government and land	Digitized economy that can fully exploit the

	cash economy with little digitization	record. Discouraging the use of cash in financial transactions	potential of AI and Blockchain by moving from web 2.0 to web 3.0
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Conclusion

While the integration of AI and blockchain technologies in tax systems offers transformative potential, it is accompanied by a range of challenges that must be carefully managed. The current legal and institutional framework, as well as human resource and IT infrastructure in Pakistan, requires significant improvement and investment to address the challenges associated with the adoption of these technologies. Tackling these challenges necessitates a holistic approach that includes technical and infrastructural development, legal and regulatory adjustments, stakeholder engagement, skill development, and financial planning. Successfully navigating these challenges is crucial to harnessing the full potential of AI and blockchain in modernizing the tax administration system in Pakistan.

Recommendations/ Way forward

Based on the analysis presented in the above sections, the following actions and policy recommendations are proposed to fully tap the potential of AI and blockchain in revenue enhancement in Pakistan:

Recommended Changes in the Legal Framework

- Formation of a regulatory legal framework that addresses data privacy issues and mandates the responsible use of AI and blockchain technology by tax authorities.
- Legal amendments to tax laws in Pakistan to permit AI-based audit selection and the performance of tax audits.
- Changes in tax laws to recognize blockchain as a legally acceptable source for record-keeping and accounting for businesses.
- Implementation of laws to discourage the use of cash in the economy and promote digital transactions to support the digitization of the economy. This will facilitate the use of AI in detecting tax fraud and evasion.
- The Federal Board of Revenue and Provincial Sales Tax Authorities should work towards developing and adopting a digital invoice system. The current Point of Sales system enforced on businesses should be replaced with blockchain-enabled invoice systems that cannot be altered.
- To fully harness the potential of blockchain, the government needs to adopt a single digital identity system for users. Currently, individuals can have multiple digital identities; however, there is a need for legislation to

develop a unified digital identity system usable across all blockchain systems within and outside the country.

Recommendations for Development of Infrastructure and Human Resources to Enable the Use of AI and Blockchain

- Upgrade the existing IT infrastructure of tax authorities to enable blockchain-based decentralized database management.
- Develop IT software tools that incorporate AI for automating routine repetitive tasks of tax authorities.
- Hire new IT professionals and train existing staff working in tax authorities on the use of AI tools and blockchain technology.
- Integrate AI into existing database systems like IRIS to perform taxpayer audits, risk assessments, predictive analysis, tax collection projections, identify tax shortfalls, areas for improvement, and new taxpayers for broadening the tax base.
- The State Bank of Pakistan should work towards developing a state-owned tokenized currency that operates on the same blockchain as that deployed by the tax authorities. This will make transactions traceable and assist tax authorities in tracking the flow of funds in the economy.

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Examining The Challenges Leading to Low Crop Yields in Pakistan: Current Realities and A Roadmap for Agricultural Advancement

Musarrat Zaman¹

Mr. Jehanzeb Khan²

KJPP

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Abstract:

Agriculture is crucial for Pakistan, contributing 24% to the national GDP and employing 37.4% of the workforce, with over 70% of the population relying on it for income. Despite its significance, the sector faces severe challenges, including low crop yields driven by water scarcity, outdated farming practices, limited access to modern technologies, climate variability, inadequate infrastructure, and policy constraints. These issues undermine food security, exacerbate poverty, and increase income disparities. Addressing these challenges requires a multifaceted approach: improving water management, adopting climate-smart agricultural practices, enhancing soil health, and integrating advanced technologies. Strategic reforms and enhanced institutional support are vital to boost productivity and resilience. This research explores the root causes of low crop yields and suggests comprehensive solutions to advance agricultural practices. By proposing targeted interventions and policy changes, the study aims to contribute to sustainable development, food security, and rural prosperity in Pakistan.

Key words: Agriculture, Crop Yields, Water Scarcity, Climate Change, Policy Reform

¹ Currently posted as Additional Secretary, Minerals Development Department, Government of Khyber Pakhtunhwa.

² Faculty Advisor

Introduction

Pakistan is an agrarian economy where agriculture plays a pivotal role in sustaining livelihoods, ensuring food security, and driving economic growth. About 24% of the national GDP is supported by agriculture, while 37.4% of the labor force is engaged in agriculture (Pakistan Bureau of Statistics, 2023). More than 70% of the population relies either directly or indirectly on agriculture for a significant part of their income. About 47% of the national land is agricultural land. However, despite its significance, the agricultural sector in Pakistan faces numerous challenges, particularly regarding low crop yields. These challenges stem from a combination of factors, including, but not limited to, water scarcity, outdated farming practices, limited access to modern agricultural inputs and technologies, climate variability, inadequate infrastructure, and policy constraints (FAO, 2023).

Low crop yields in Pakistan not only endanger food security but also impede socio-economic progress, fueling poverty, migration, and income disparities. Traditional farming methods leave agriculture vulnerable to natural disasters and market fluctuations. Addressing these challenges requires a deep understanding of farming practices, water management, and market dynamics, culminating in evidence-based policy reforms and technological innovations to enhance agricultural productivity and resilience.

Through this research endeavor, it is envisaged to contribute to the broader goal of enhancing food security, promoting rural development, and fostering inclusive agricultural growth in Pakistan. By addressing the underlying causes of low crop yields and charting a path towards agricultural advancement, the research aims to catalyze transformative changes in the agricultural sector, thereby unlocking its full potential as an engine of sustainable development and prosperity.

Statement of Problem

The agricultural sector in Pakistan, despite its significance as a primary contributor to the national economy, is facing the challenge of low crop yields. This issue not only poses threats to the country's food security but also weakens economic resilience. Understanding the intricate factors contributing to these low yields is crucial for formulating targeted interventions and developing a comprehensive roadmap for sustainable agricultural growth.

This paper attempts to devise an effective roadmap for agricultural development. To achieve this, a thorough examination and study of the current realities are necessary. Furthermore, this research aims to identify practical and context-specific solutions, including the integration of technology, climate-resilient farming techniques, improved water management strategies, and policy reforms that collectively contribute to

sustainable agricultural development, analyzing the main causes of low crop yields in Pakistan and recommending a way forward.

Review of Literature

Water Scarcity

Kirby et al. (2017) examined Pakistan's water usage, population dynamics, food production, and security, revealing a stark reality: despite adequate wheat production, over half the population faces food insecurity, with 47% experiencing calorie deficiencies. Unequal food access and dependence on irrigation exacerbate this issue. As the population grows, so does the demand for food, necessitating increased production or imports to maintain current security levels (Ahmad and Farooq, 2010).

Numerous studies underscore Pakistan's agricultural challenges, including poor crop productivity and irrigation inefficiency. Wheat productivity significantly lags behind India and California, with the flood irrigation system causing substantial water losses, especially impacting small-scale farmers. Water scarcity exacerbates these issues, prompting recommendations for resilience improvement (Khan, 2014; Watto and Muger, 2016; Basharat, 2019; Young et al., 2019).

With over 90% of food production reliant on irrigation (FAO, 2016), Pakistan faces decreased per capita water availability due to population growth, leading to groundwater overexploitation and water quality threats (Condon et al., 2014). Addressing these challenges necessitates strategies proposed by various studies, such as developing new dams, enhancing water productivity, and improving governance (WSTF, 2012; Condon et al., 2014).

Climate change further compounds water availability issues, impacting crop yields. Adaptive measures, including adjusting sowing dates and intensifying research for high-yielding crop varieties, offer potential mitigation strategies (Sultana et al., 2009; Zhu et al., 2013; Rehman et al., 2015; Gorst et al., 2018). Pakistan's agrarian economy underscores the critical role of its agriculture sector in sustaining livelihoods and security (Munir et al., 2021).

Climate Change

Iqbal et al. (2009) highlight climate change's profound impact on agricultural productivity. Elevated temperatures shorten the growing period and crop life-cycle, resulting in yield losses, particularly in rain-fed wheat areas. Climate-induced alterations in river flows exacerbate water scarcity and contribute to land degradation. Extreme climate events disrupt farming operations, emphasizing the need for resilient agricultural practices to safeguard food security and livelihoods.

Research analyzing global climate models (GCMs) indicates significant shifts in regional and global precipitation and air temperature, likely impacting groundwater recharge. Projections indicate that climate change will lead to significant alterations in rainfall patterns, river flows, and sea levels globally

over the next century, posing substantial risks to agricultural yields (Ali et al., 2017). This increase in climate variability is acknowledged as a global anomaly with potentially enduring consequences, marked by more frequent occurrences of extreme weather events (Stern, 2008). Developing countries, despite contributing only 10% of annual global CO₂ emissions, are disproportionately vulnerable to the impacts of climate change (Maskrey et al., 2007). The reliance of many South Asian countries on agrarian economies makes them particularly susceptible to these climatic shifts, posing serious threats to their social, economic, and ecological systems (Ahmed & Schmitz, 2011). The World Bank's South Asia Climate Change Strategy highlights that the poorest will suffer most from climate change, especially those dependent on climate-sensitive incomes (Ali et al., 2017).

Pakistan's vulnerability to climate change is heightened by its diverse weather conditions and ecological challenges. With agriculture pivotal to the economy and employment, climate-related impacts like temperature rise, droughts, and floods pose significant risks. Urgent measures are necessary to mitigate these effects and protect livelihoods in the face of extreme weather events (Ali et al., 2017).

Land Degradation and Deforestation

Land degradation significantly hampers agricultural productivity, food security, and rural livelihoods in many developing countries, including Pakistan (FAO, 2006). Around 40-75% of global agricultural land suffers reduced productivity due to degradation, affecting approximately 1.5 billion people worldwide (Jolejole-Foreman et al., 2012; Bai et al., 2008). Unsustainable land practices and deforestation worsen environmental challenges, including biodiversity loss and climate change impacts, emphasizing the urgent need for mitigation efforts (Hussain, 2022).

Pakistan's arid landscape, vital for rural livelihoods, suffers from severe land degradation due to unsustainable practices and resource demands, worsening environmental issues and rural poverty. Urgent sustainable land management is crucial to mitigate threats like water scarcity and deforestation, ensuring future welfare. Farmers, vulnerable to natural uncertainties, contribute to poverty. Hindered by limited consultation, effective planning and technology adoption are impeded (Khan et al., 2013; Farooq et al., 2008). Lal (2018) underscores challenges in managing soil and water resources due to improper practices and climate change. Despite agricultural productivity growth, doubling food production by 2050 demands improved yields amid rising drought stress. Soil degradation and desertification, exacerbated by harsh climates, pose significant challenges, worsened by a growing population and uncertain climate. Soil erosion, highlighted since Harold Glover's report in 1941, remains a pressing concern, particularly in Punjab province (Khan et al., 2012).

Pests and Diseases

The Food and Agriculture Organization (FAO, 2019) has issued alarming statements concerning crop loss attributable to pests. It estimates that pests contribute to a reduction in global crop production ranging from 20% to 40%. Additionally, further losses occur during the post-harvest phase and distribution, as well as at the consumer level.

Crop health confronts mounting challenges from climate change, pests, and insufficient agricultural responses (CABI, 2016). Despite recognizing that pests cause about 40% of yield losses, data tracking remains limited. Initiatives like the Global Burden of Crop Loss aim to quantify these losses, aiding decision-makers in tackling food security and economic impacts. Crop pathogens and pests significantly reduce yield and quality, undermining food security globally. Regional disparities underscore the need to prioritize crop health management for sustainable agroecosystems (Savary et al., 2019). Wheat, vital for Pakistan's agriculture, faces threats from various pests, necessitating sustainable pest control measures to minimize yield losses (Hussain et al., 2022).

Cotton is vital to Pakistan's economy, contributing 7.8% to agricultural value addition and meeting 55% of domestic cooking oil needs. However, it faces challenges from numerous insect pests and diseases, causing yield losses of 20–40%. Effectively managing these pests remains a significant challenge for agricultural experts and growers (Karar et al., 2020). Khan et al. (2023) revealed significant yield reduction in tomatoes due to pests like cutworms, whiteflies, and leaf miners, despite mitigation efforts. Barasa et al. (2019) supported these findings.

Technological and Knowledge Gaps

The term "technology" refers to the application of knowledge and tools for achieving specific goals and economic objectives (Masood et al., 2012). In the context of agriculture, this entails striving for enhanced productivity through the adoption of innovative and modern agricultural techniques. However, in Pakistan, the majority of farmers rely on outdated traditional agricultural methods, leading to diminished land productivity (Sattar, 2012).

Small-scale farmers in impoverished regions often resort to traditional farming methods (Ali, 2010), resulting in meager crop yields despite increased investment in inputs and fertilizers (Khan, 2012; Sattar, 2012). The prevalence of traditional practices stems from a lack of awareness and access to modern farming technologies, compounded by poverty and the high costs associated with modern equipment (Jhangir et al., 2007).

Lack of awareness and poverty contribute to challenges faced by farmers in adopting modern agricultural technologies aimed at enhancing land productivity. Many farmers remain uninformed about these technologies, and poverty acts as a significant barrier, limiting their access to modern advancements (Phillip et al., 2009; Sattar, 2012). Additionally, small land

holdings pose a considerable obstacle to the adoption of modern agricultural practices (Sattar, 2012).

Despite successful innovations like laser land leveling (LLL), zero tillage, and high-efficiency irrigation systems, their widespread adoption encounters obstacles. Laser land leveling increases crop yield by 20%, and zero tillage by 12-15% (Ahmad, 2009). Barriers include financial constraints, high costs, limited access, small land holdings, and a preference for traditional practices (Jehangir et al., 2007). Although modern technology holds promise for agricultural productivity, its adoption remains slow among Pakistani farmers. Scaling up requires practical policy measures like better equipment supply, field demonstrations, and financial support, alongside promoting local manufacturing with private sector involvement (Rehman et al., 2015).

Methods and Materials

Interviews and Focus Group Discussions

In-depth interviews with key stakeholders provided valuable insights into the intricacies of agricultural practices and challenges.

Field Observations

Field visits to farmers' fields facilitated first-hand observation of farming practices. This direct observation allowed for the documentation of agricultural techniques employed by farmers. Moreover, qualitative insights were gathered through keen observation and interaction with farmers.

Comparative Analysis

A comparative analysis of agricultural practices and policies was conducted to identify areas for improvement. This analysis involved reviewing case studies and reports from comparable agricultural systems worldwide, with a focus on applicability to the specific context of Pakistan.

Expert Consultations

Engagement with agricultural experts, researchers, and scholars enriched the understanding of complex agricultural issues. Their opinions and expertise on potential solutions and strategies were sought, which was instrumental in devising effective interventions for improvement.

Dimensions of Low Crop Yield in Pakistan

When analyzing the challenges contributing to low crop yields (as highlighted for major crops in Table 1 & Fig. 1) in Pakistan, several dimensions emerged, each impacting the country's complex agricultural landscape. One significant dimension revolves around agricultural practices and technology. Outdated farming methods and limited adoption of modern agricultural technologies hinder productivity, necessitating a shift towards

innovative techniques, mechanization, and precision agriculture to enhance crop yields. Understanding the intricate factors contributing to these low yields is crucial for formulating targeted interventions and developing a comprehensive roadmap for sustainable agricultural growth (analysis of agricultural growth for the previous decade has been summarized in Table 2 & Fig. 2).

Water management is crucial for Pakistan's agriculture, but inefficient systems, water scarcity, and poor management exacerbate yield limitations. Solutions include adopting water-saving technologies like drip irrigation and improving infrastructure to optimize water usage. Soil health and land degradation also impact crop yields. Soil erosion, salinization, and nutrient depletion degrade soil quality, posing challenges. Strategies involve soil conservation practices, promoting organic farming, and combating land degradation to rejuvenate soil health and enhance yields. Climate change resilience is vital for crop yields. Increasing climate variability and extreme weather events threaten production, requiring climate-resilient crop varieties and smart agricultural practices for sustainable yields despite changing conditions.

Pests and diseases management is crucial for improving crop yields. Integrated pest management, bio-pesticides, and disease surveillance are needed to control outbreaks and minimize losses. Access to inputs and credit is vital, especially for smallholder farmers. Limited access to quality seeds, fertilizers, pesticides, and credit constrains farmers' ability to optimize yields. Strengthening input supply chains, providing financial support, and enhancing access to credit and extension services are essential to empower farmers and improve crop yields.

These challenges underscore the multifaceted nature of low crop yields in Pakistan, requiring comprehensive strategies and interventions to promote sustainable agricultural development.

Table 1. Production of Important Crops (000 Tonnes)

Year	Cotton (000 bales)	Sugarcane	Rice	Maize	Wheat
2014-15	13,960	62,826	7,003	4,937	25,086
	-	-	-	-	-
2015-16	9,917	65,482	6,801	5,271	25,633
	(-29.0)	(4.2)	(-2.9)	(6.8)	(2.2)
2016-17	10,671	75,482	6,849	6,134	26,674
	(7.6)	(15.3)	(0.7)	(16.4)	(4.1)
2017-18	11,946	83,333	7,450	5,902	25,076
	(11.9)	(10.4)	(8.8)	(-3.8)	(-6.0)
2018-19	9,861	67,174	7,202	6,826	24,349
	(-17.5)	(-19.4)	(-3.3)	(15.7)	(-2.9)
2019-20	9,148	66,380	7,414	7,883	25,248

	(-7.2)	(-1.2)	(2.9)	(15.5)	(3.7)
2020-21	7,064	81,009	8,419	8,465	27,293
	(-22.8)	(22.0)	(13.6)	(7.4)	(8.1)

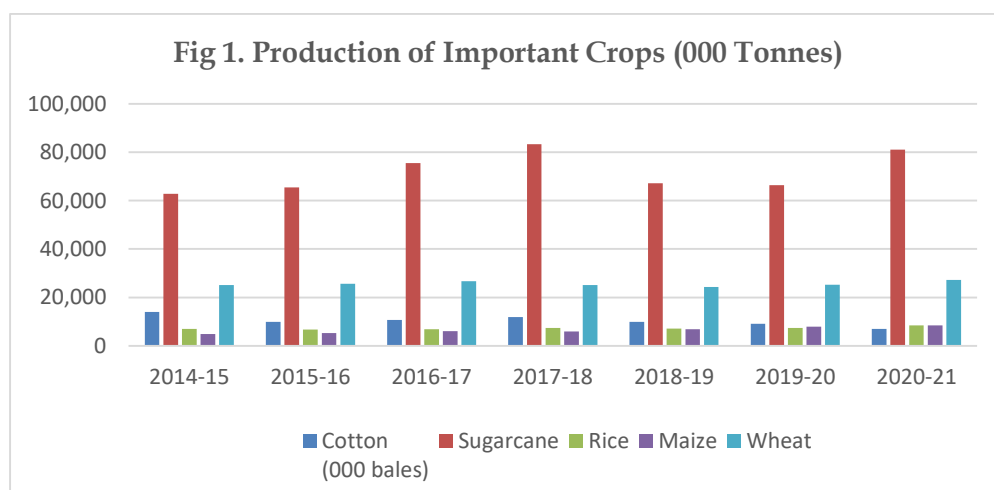
Note: Figures in parentheses are growth/decline rates

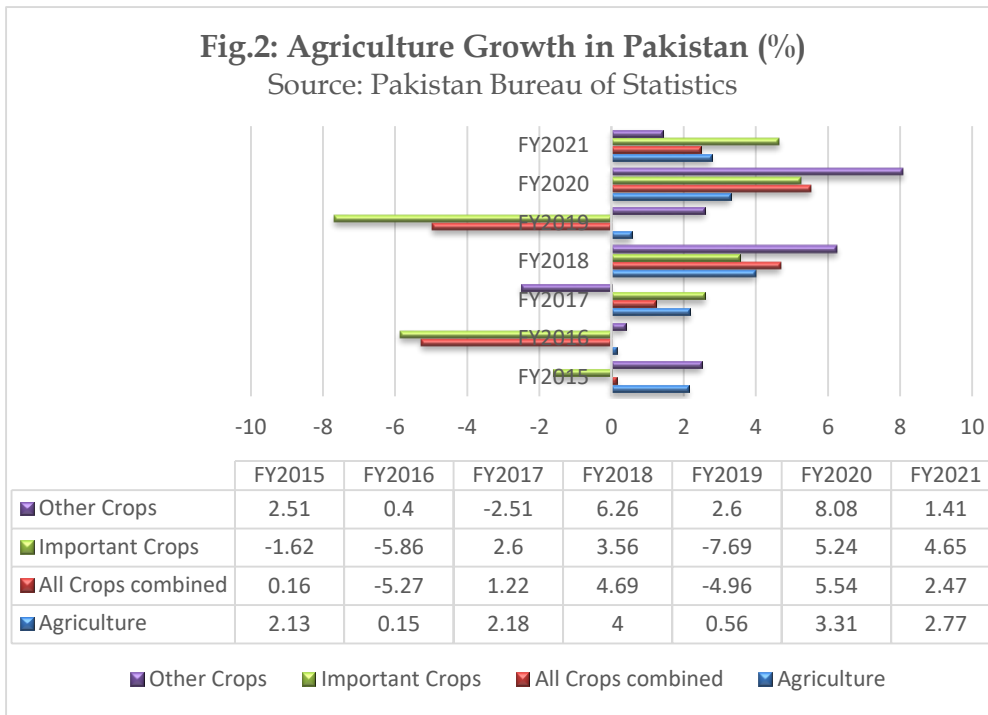
Source: Pakistan Bureau of Statistics

Table 2. Agriculture Growth

Sector	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021
Agriculture	2.13	0.15	2.18	4	0.56	3.31	2.77
1.Crops (i+ii+iii)	0.16	-5.27	1.22	4.69	-4.96	5.54	2.47
i) Important Crops	-1.62	-5.86	2.6	3.56	-7.69	5.24	4.65
ii) Other Crops	2.51	0.4	-2.51	6.26	2.6	8.08	1.41
iii) Cotton Ginning	7.24	-22.12	5.58	8.8	-12.74	-4.82	-15.58
2.Livestock	3.99	3.36	2.99	3.7	3.82	2.1	3.06
3.Forestry	-12.45	14.31	-2.33	2.58	7.28	3.6	1.42
4.Fishing	5.75	3.25	1.23	1.62	0.8	0.6	0.73

Source: Pakistan Bureau of Statistics





Major Challenges Leading to Low Crop Yields in Pakistan

In Pakistan, challenges to low crop yields mirror global issues, including water scarcity, climate change, soil degradation, outdated farming practices, infrastructure gaps, pests and diseases, limited access to credit and inputs, and socio-economic factors. Research has thoroughly examined and identified these challenges, leading to the development of a roadmap with potential solutions. To enhance crop yields, a comprehensive approach is needed, involving sustainable water management, climate-smart agriculture promotion, modern farming practices adoption, rural infrastructure investment, and improved access to credit and education for farmers. Overcoming these obstacles requires concerted efforts through government policies, international collaborations, and community engagement.

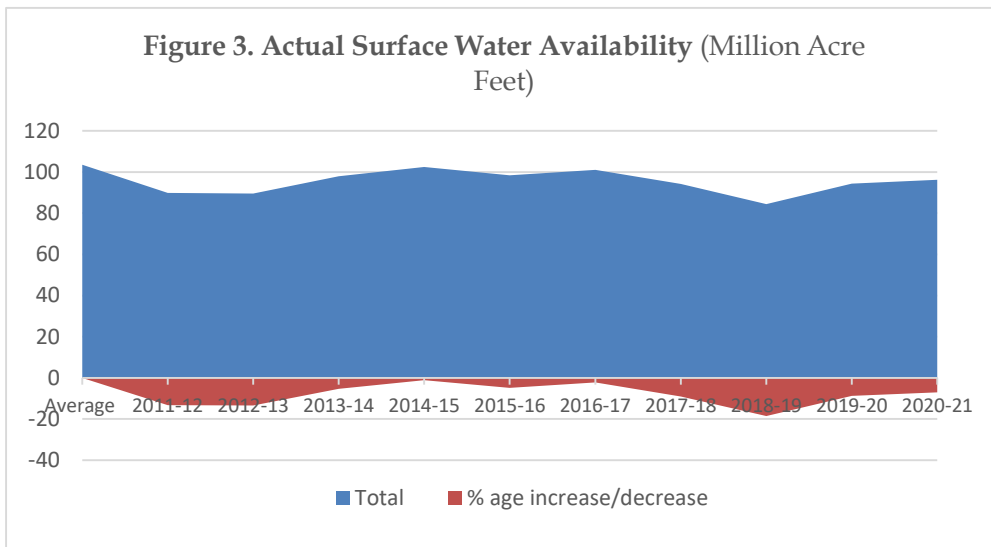
Water Scarcity

Water scarcity challenges Pakistan's agriculture, reducing crop yields due to heavy reliance on irrigation. Water availability has always been a problem in the country; the decrease in average system usage has been summarized in Table 3 and Fig. 3.

Table 3. Actual Surface Water Availability (Million Acre Feet)

Period	Kharif	Rabi	Total	% age increase/decrease
Average	67.1	36.4	103.5	0

system usage				
2011-12	60.4	29.4	89.8	-13.2
2012-13	57.7	31.9	89.6	-13.4
2013-14	65.5	32.5	98	-5.3
2014-15	69.3	33.1	102.4	-1.1
2015-16	65.5	32.9	98.4	-4.9
2016-17	71.4	29.7	101.1	-2.3
2017-18	70	24.2	94.2	-9
2018-19	59.6	24.8	84.4	-18.5
2019-20	65.2	29.2	94.4	-8.8
2020-21	65.1	31.2	96.3	-7



Source: Indus River System Authority

Following are some of the water scarcity-related reasons for low crop yield:

1. Pakistan heavily relies on the Indus River for irrigation, but water availability is often inadequate due to climate variability, reduced glacial melt, and inefficient water management practices.
2. Inefficient water use and management practices contribute to wastage.
3. Aging irrigation infrastructure leads to water losses and uneven distribution.
4. Changing climate patterns result in irregular rainfall, affecting water availability.
5. Over-extraction of groundwater leads to a declining water table.
6. Increasing population puts additional pressure on water resources for domestic and industrial use, impacting agriculture.

Climate Change:

Climate change poses challenges to global agriculture, impacting Pakistan with erratic rainfall, rising temperatures, and extreme weather events, leading to low crop yields. Coping requires a comprehensive approach involving research, policy, innovation, and community engagement for resilience and food security. Reasons outlined below:

1. Changes in rainfall patterns, including irregular timing and intensity, can lead to water stress and drought conditions during critical crop growth stages.
2. Rising temperatures can accelerate crop maturation, reduce crop duration, and increase heat stress on crops, leading to reduced yields.
3. Climate change can create favorable conditions for the proliferation of pests and diseases, leading to increased infestations and crop damage.
4. Climate change exacerbates water scarcity issues, reducing water availability for irrigation and crop production.
5. Changes in temperature and precipitation patterns can alter traditional growing seasons, affecting crop phenology and reducing yields.
6. Climate change contributes to soil erosion, salinization, and degradation, reducing soil fertility and agricultural productivity.

Soil Degradation:

Low crop yield in Pakistan due to soil degradation can be attributed to various factors. Soil degradation refers to the decline in soil quality and fertility, which adversely affects agricultural productivity. Here are some reasons for low crop yield in Pakistan related to soil degradation:

1. Wind and water erosion can lead to the loss of topsoil, reducing soil fertility.
2. Continuous monocropping.
3. Excessive and improper use of chemical fertilizers.
4. Excessive irrigation in arid regions can lead to the accumulation of salts in the soil.
5. Poor drainage systems can lead to waterlogging.
6. Clearing forests for agriculture can lead to the loss of organic matter and disrupt the ecosystem balance.

Outdated Farming Practices:

Low crop yield in Pakistan due to outdated farming practices can be a significant challenge, as traditional methods may not be as efficient or sustainable in modern agricultural contexts. Here are some reasons for low crop yield in Pakistan related to outdated farming practices:

1. Reliance on traditional and inefficient irrigation methods can lead to uneven water distribution and water wastage.
2. Traditional plowing methods cause soil erosion, damage to soil structure, and increased vulnerability to water and wind.
3. Relying on the cultivation of a single crop over large areas can deplete soil nutrients and increase the risk of pest and disease outbreaks.
4. Lack of adoption of modern agricultural technologies and machinery can hinder efficiency and productivity.
5. Farmers may use traditional or low-quality seeds, limiting crop potential.
6. Improper post-harvest handling practices can result in significant losses.

Infrastructure and Technology Gaps:

Low crop yield in Pakistan due to infrastructure and technology gaps can significantly impact the efficiency and productivity of the agricultural sector. Here are some reasons for low crop yield in Pakistan related to these gaps:

1. Traditional manual methods or outdated machinery can be inefficient and labor-intensive.
2. Lack of communication infrastructure in rural areas can hinder the timely dissemination of information on weather forecasts, market prices, and agricultural practices.
3. Inadequate post-harvest infrastructure, including storage facilities and transportation networks, can result in significant crop losses.
4. Limited awareness and knowledge about modern agricultural technologies and practices can hinder their adoption.
5. Insufficient investment in agricultural research and development can impede the introduction of new and improved crop varieties and technologies.
6. Power shortages can affect the operation of irrigation systems and limit the use of modern agricultural machinery.

Pests and Diseases:

Low crop yield in Pakistan due to pests and diseases is a significant concern for agriculture. Several factors contribute to this issue, and implementing effective pest and disease management strategies is essential. Here are some reasons for low crop yield in Pakistan related to pests and diseases:

1. Planting the same crop repeatedly in a given area can create a favorable environment for pests and diseases to thrive.
2. Lack of regular monitoring and early detection systems can result in delayed response to pest and disease outbreaks.
3. Overreliance on chemical pesticides without considering ecological and biological factors can lead to resistance and environmental issues.

4. Farmers may not have access to crop varieties that are resistant to prevalent pests and diseases.
5. Improper water management practices, such as over-irrigation, can create conditions conducive to certain diseases.
6. Changes in temperature and precipitation patterns can influence the prevalence and distribution of pests and diseases.

Limited Access to Credit and Inputs:

Limited access to credit and inputs can significantly impact crop yields in Pakistan in the following ways. Several factors contribute to this issue, and addressing them is crucial for improving agricultural productivity:

1. Farmers may face challenges in securing loans or credit for purchasing seeds, fertilizers, pesticides, and other essential inputs.
2. The cost of agricultural inputs, including seeds, fertilizers, and pesticides, may be high, making them unaffordable for small-scale farmers.
3. Traditional lending institutions may require collateral, which many smallholder farmers may not possess.
4. Some farmers may lack the financial knowledge needed to navigate the credit application process.
5. Poor infrastructure in rural areas can limit the reach of financial institutions and hinder the delivery of credit and inputs.
6. Farmers may hesitate to invest in inputs due to market uncertainties and price volatility.

Socio-economic Factors:

Socio-economic factors play a crucial role in influencing agricultural productivity and crop yield in Pakistan. Addressing these factors is essential for sustainable agricultural development. Here are some reasons for low crop yield related to socio-economic factors in Pakistan:

1. Inheritance practices often lead to the subdivision of agricultural land, resulting in small and uneconomical farm sizes.
2. Widespread poverty in rural areas can limit farmers' capacity to invest in quality inputs and modern farming practices.
3. Poor health conditions can affect the labor productivity of farmers, leading to lower crop yields.
4. Insufficient infrastructure, including roads, transportation, and market facilities, can hinder the efficient movement of agricultural produce.
5. Farmers may adhere to traditional methods due to cultural norms, lack of exposure, or resistance to change.
6. Limited access to credit can constrain farmers from making necessary investments in inputs and technology.

Pakistan's Agriculture Policy Gap Analysis

One significant policy gap in Pakistan's agriculture policy that hinders the advancement of agriculture is the lack of effective implementation and enforcement mechanisms. Despite the existence of various policies and strategies aimed at promoting agricultural development, there is often a gap between policy formulation and implementation on the ground. This gap can be attributed to several factors:

1. Governmental bodies lack resources and expertise to implement agricultural policies effectively.
2. Lack of collaboration among departments and stakeholders leads to disjointed efforts.
3. Political instability: Changes in leadership disrupt policy implementation, affecting long-term planning and investment in agriculture.
4. Insufficient mechanisms hinder progress evaluation, impeding evidence-based policy adjustments.
5. Smallholder farmers struggle to access credit, inputs, and technology due to ineffective policies.
6. Policies often fail to address farmers' needs and local challenges effectively, creating a disconnect between intent and reality.

Roadmap for Agricultural Advancement

To advance agriculture in Pakistan and improve overall agricultural productivity, a comprehensive roadmap is essential on the following aspects:

Water Management and Irrigation:

- Upgrade and modernize the irrigation system to reduce water wastage and improve efficiency.
- Invest in water storage facilities and dam construction to address water scarcity issues.
- Promote efficient water-use practices, such as drip and sprinkler irrigation.

Climate-Smart Agriculture:

- Implement climate-resilient farming practices to mitigate the impact of climate change.
- Introduce drought-tolerant and heat-resistant crop varieties.
- Encourage the adoption of agroforestry to enhance resilience and carbon sequestration.

Soil Health Improvement:

- Promote sustainable soil management practices, including organic farming and cover cropping.

- Conduct soil health assessments and provide farmers with information on appropriate soil amendments.
- Implement conservation agriculture techniques to prevent soil erosion and degradation.

Technology Adoption:

- Provide farmers with access to modern agricultural technologies, including precision farming, satellite imaging, and mobile applications for farm management.
- Promote the use of genetically modified crops that are resistant to pests and diseases.
- Facilitate training programs to educate farmers on the use of new technologies.

Infrastructure Development:

- Improve rural infrastructure, including roads, storage facilities, and market access.
- Establish cold storage facilities to reduce post-harvest losses.
- Upgrade transportation networks to facilitate the efficient movement of agricultural products.

Research and Development:

- Invest in agricultural research to develop high-yielding crop varieties adapted to local conditions.
- Support research on innovative farming techniques, sustainable practices, and biosecurity measures.

Extension Services and Farmer Education:

- Strengthen extension services to provide farmers with up-to-date information and best practices.
- Establish farmer training centers to enhance agricultural skills and knowledge.
- Promote agricultural education at all levels to ensure a knowledgeable farming community.

Access to Credit and Inputs:

- Facilitate access to credit for smallholder farmers through government programs and financial institutions.
- Subsidize agricultural inputs such as seeds, fertilizers, and pesticides to make them more affordable.

Policy Support and Governance:

- Formulate and implement farmer-friendly policies that address the needs of diverse agricultural communities.
- Establish regulatory frameworks to ensure the sustainable use of natural resources and promote responsible agricultural practices.
- Encourage public-private partnerships to attract investment in the agricultural sector.

Conclusion

The analysis highlights some major challenges contributing to low crop yields in Pakistan, encompassing systemic, environmental, socio-economic, and technological dimensions. Water scarcity and irrigation issues, exacerbated by inefficient management practices and climate change impacts, emerge as critical obstacles. Soil degradation, pests, diseases, and limited access to inputs and technology further hinder productivity enhancement efforts. Moreover, socio-economic disparities, policy and governance challenges, and market access barriers exacerbate the situation, undermining agricultural sustainability and rural livelihoods. Addressing these challenges requires a holistic approach that integrates sustainable water management, climate-resilient agriculture, soil conservation, technology adoption, policy reforms, and institutional capacity building.

Recommendations

- Implement water-efficient cropping patterns to mitigate water scarcity and improve irrigation efficiency.
- Invest in water infrastructure upgrades and promote water-saving irrigation techniques.
- Develop climate-smart agricultural practices, including drought-resistant crop varieties, agroforestry, and rainwater harvesting, to enhance resilience to climate change impacts.
- Implement soil conservation measures to combat soil degradation and restore soil fertility.
- Strengthen pest monitoring and surveillance systems and promote integrated pest management approaches.
- Facilitate access to modern agricultural technologies specifically for small landholders.
- Enact policy reforms to prioritize sustainable practices, incentivize innovation, and address socio-economic disparities in access to resources and markets.
- Enhance the capacity of agricultural extension services, research institutions, and farmer cooperatives to provide technical support, training, and knowledge dissemination to farmers.

- Improve market infrastructure, reduce trade barriers, and establish fair trade practices to enhance farmers' access to markets, promote price stability, and diversify income sources.
- Initiate joint ventures and public-private partnerships to bring a large chunk of uncultivated lands under corporate farming.

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COMPARATIVE POLICY ANALYSIS: PAKISTANI VS. INDIAN UNSKILLED LABOUR MIGRATION IN GCC NATIONS

Syed Shahid Ali Shah¹

Mr. Jehanzeb Khan²



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Migration has long been integral to South Asian economies and societies, with significant global impact due to the substantial South Asian diaspora. Countries such as India, Pakistan, Bangladesh, Nepal, Sri Lanka, Afghanistan, and Bhutan contribute a major portion of global migrants, primarily as laborers in low and semi-skilled occupations. Between 2000 and 2020, migration from Central and Southern Asia to North Africa and West Asia surged, reflecting a broader trend of labor migration from these countries. Indian and Pakistani migration policies, particularly regarding unskilled workers, exhibit notable differences. India has developed extensive support systems and protection mechanisms for its migrants, including skill certification programs, whereas Pakistan's policies are less comprehensive and less effective in safeguarding unskilled workers, especially women. Recommendations include enhancing legislation, expanding skill development, and strengthening bilateral agreements to improve the migration process and support for Pakistani workers in the Gulf Cooperation Council (GCC) countries.

Key words: Migration, South Asia, GCC, Emigration Policy, Labor Protection

¹ Currently posted as Deputy Director, Bureau of Emigration & Overseas Employment (BE&OE) Head Quarter, Ministry of Overseas Pakistani & Human Resource Development, Islamabad

² Faculty Advisor

Introduction

For ages, migration has been a cornerstone of South Asian civilization and economy, with individuals and communities dispersed across the globe. South Asian countries—India, Pakistan, Bangladesh, Nepal, Sri Lanka, Afghanistan, and Bhutan—form a large percentage of the world's population, and migration from the region has transformed communities not only in the home countries but also across the world.

Pakistan, Bangladesh, Nepal, Sri Lanka, Afghanistan, and Bhutan collectively constitute a significant portion of the global population. Migration originating from this region has not only shaped communities within their respective home countries but has also left a lasting impact worldwide. The South Asian diaspora stands among the largest globally, with India boasting the largest diaspora at over 17.7 million, Bangladesh with seven million, and Pakistan with approximately six million migrants, all ranking among the top ten largest diasporas globally (IOM, 2022).

According to the United Nations (2020), the most rapidly expanding migration corridor between 2000 and 2020 was identified as the one from Central and Southern Asia to North African and West Asian countries, with an increase of 13 million migrants during this period. This growth is explicitly linked to a substantial rise in the number of labor migrants, primarily originating from India, Pakistan, Nepal, Sri Lanka, and Bangladesh (UN-DESA, 2017).

The majority of these individuals undertaking migration are labor migrants, journeying to various global destinations predominantly for low and semi-skilled occupations. Despite having relatively low formal human capital, unskilled migrant workers are theorized to contribute to enhancing productivity by improving efficiency and upgrading the skills of the local labor force. Empirical studies support the notion that positive effects on productivity do exist. This body of evidence does not offer a compelling rationale for advocating the closure of national borders to unskilled foreigners based on economic considerations. Estimates indicate that, among the 38 million South Asians worldwide, a predominant portion is engaged in labor migration. Specifically, during the period from 2012 to 2017, Bangladesh, India, Nepal, and Pakistan collectively dispatched a major workforce (World Bank, 2022).

Statement of Problems

The migration of unskilled manpower to GCC countries plays a vital role in bolstering the economy. However, there is a prevalent perception that Pakistan's current emigration process requires a significant overhaul compared to India's mechanism. Addressing this concern necessitates a comparative policy analysis of the existing emigration legal framework in

Pakistan, including institutional and legislative aspects, as well as MoUs with GCC nations, juxtaposed with the Indian approach. This analysis aims to identify necessary improvements and propose remedial measures.

Research Questions

In order to understand and investigate the policy gap in the existing policy for the migration of unskilled workers to GCC from Pakistan and India, there is a need for an updated study to highlight the true picture and address all necessary aspects lacking in the existing studies. In this regard, the present study addresses multiple questions such as:

- Do the existing institutional frameworks need any paradigm shift after institutional analysis with India in the context of GCC nations?
- Is the existing legislation regarding unskilled migrants up to standard with the modern world, or does it need necessary amendments after comparison with India?
- Do the existing MoUs of Pakistan cover migrant rights and protection in GCC nations?
- Is the existing policy for the provision of welfare services in line with worldwide best practices after comparison with India?

These questions can only be answered with the help of a comprehensive comparative analysis of the institutional and legislative frameworks and the analysis of providing welfare services to unskilled workers from Pakistan and India in the context of GCC nations.

Scope of the Study

The current study analyzed and compared the flow of unskilled emigrants from Pakistan and India to GCC and also compared the flow of foreign remittances to Pakistan and India from unskilled migrant workers in GCC countries. The study also compared the agreements/MoUs of Pakistan and India for the export of manpower with GCC countries. Finally, the study covered and analyzed the institutional and legislative framework and the policy for providing welfare services to the unskilled workers of Pakistan and India in GCC countries. Furthermore, the identification of areas for reform and recommendations for feasible policy improvements in the existing emigration process from Pakistan, including the role of the Bureau of Emigration and Overseas Employment since its inception, has also been included in the scope of the study.

Literature Review

This literature review highlights the intricate interplay of policies, economic factors, and social dynamics shaping the migration of unskilled workers from Pakistan and India to GCC countries. Through an examination of historical trends, policy frameworks, and socio-economic impacts, it offers valuable insights for policymakers, researchers, and practitioners seeking to understand and address the challenges and opportunities associated with labor mobility within the South Asia-GCC migration corridors.

In response to the escalating issues surrounding unskilled laborers, the Indian government implemented the Emigration Act in 1983, replacing prior legislation dating back to 1922. This Act aimed to regulate the growing number of labor migrants departing from the country (Srivastava, 2020). Subsequently, in 2004, the Ministry of Overseas Indian Affairs (MOIA) was established with a specific mandate to oversee all matters concerning Indians residing abroad (Khan, 2023). The primary objective of this ministry was to establish a robust institutional framework facilitating mutually beneficial networks with and among Overseas Indians, maximizing developmental impacts for India, and enabling overseas Indians to engage in and benefit from opportunities within India (Tang et al., 2020). The ministry focused its efforts on diaspora engagement, particularly concerning labor migration to the Gulf. Over the past decade, the Indian government has signed Memorandums of Understanding with all GCC countries and instituted systems to monitor the implementation of these agreements (Shah et al., 2020). However, the merger of the MOIA with the Ministry of External Affairs in January 2016 aimed to streamline government intervention while ensuring effective administration, albeit resulting in the cessation of the publication of annual outflow data previously available in the MOIA's annual reports. This created a gap in publicly accessible information regarding annual outflows compared to several other South Asian nations (Kaburu & Adara, 2023).

In Pakistan, amidst challenges of rapid population growth, widespread unemployment, and sluggish economic growth, labor export has emerged as a crucial strategy to address these issues. This policy ensures a consistent influx of remittances sent back home by migrant workers, benefiting both the government and individual families. Pakistan's migration policies trace back to the Emigration Ordinance of 1979, which laid out regulations and provisions to regulate and facilitate migration, emphasizing pre-departure instruction and advice for departing migrants. Subsequent changes have guided the migration process up to the present time (Shah et al., 2020; Varghese, 2023).

In 2009, the government attempted to revamp its policy with the establishment of a preliminary National Emigration Policy, focusing on

optimizing the number of people leaving Pakistan, increasing the country's share of migrants in the Gulf and elsewhere, assisting migrants in financing migration costs, facilitating remittance inflows, and streamlining migration procedures (Giuntella et al., 2021; Shah et al., 2020). However, evaluations found deficiencies in safeguarding migrant worker well-being and a Gulf-centric approach that neglected workers in other regions (Atique, 2021). Additionally, protective measures were deemed reactive, failing to address underlying issues stemming from host countries' policies in the Gulf. In 2013, collaboration between the Ministry of Overseas Pakistanis and the International Labour Organisation (ILO) led to the development of a new National Policy for Overseas Pakistanis, aiming to enhance the well-being and empowerment of Pakistani citizens abroad (Aarthi & Sahu, 2021). In 2013, a collaborative effort between the Ministry of Overseas Pakistanis and the ILO led to the formulation of a new National Policy for Overseas Pakistanis (Javaid, 2020). The primary aim of this policy was to improve the well-being and empowerment of Pakistani citizens residing and working abroad. To initiate this process, a consultative workshop was convened to present an initial proposal outlining various focal areas (Qiasrani, 2022). These areas encompassed the endorsement of ILO conventions pertaining to migrant workers' rights, the promotion of women's participation in migration, recognition of social protection as a fundamental human right, support for social network organizations in host countries, and the implementation of vocational and technical training programs to address the demand for overseas employment (Gull & Chaudhary, 2021). These initiatives were anticipated to enhance the operational framework concerning both unskilled and skilled migrant workers in GCC countries. However, despite these advancements, certain limitations or gaps within the policies have been identified, as elaborated in the subsequent section.

Situational Analysis

Unskilled migration from Pakistan and India to the Gulf Cooperation Council (GCC) nations has become a significant phenomenon over the past few decades, driven by economic disparities, demographic trends, and labor market dynamics. This situational analysis aims to provide a comprehensive overview of the current state of migration from Pakistan and India to GCC countries, focusing on key trends, challenges, and opportunities.

Number of Unskilled Migrants to GCC Nations from Pakistan and India:

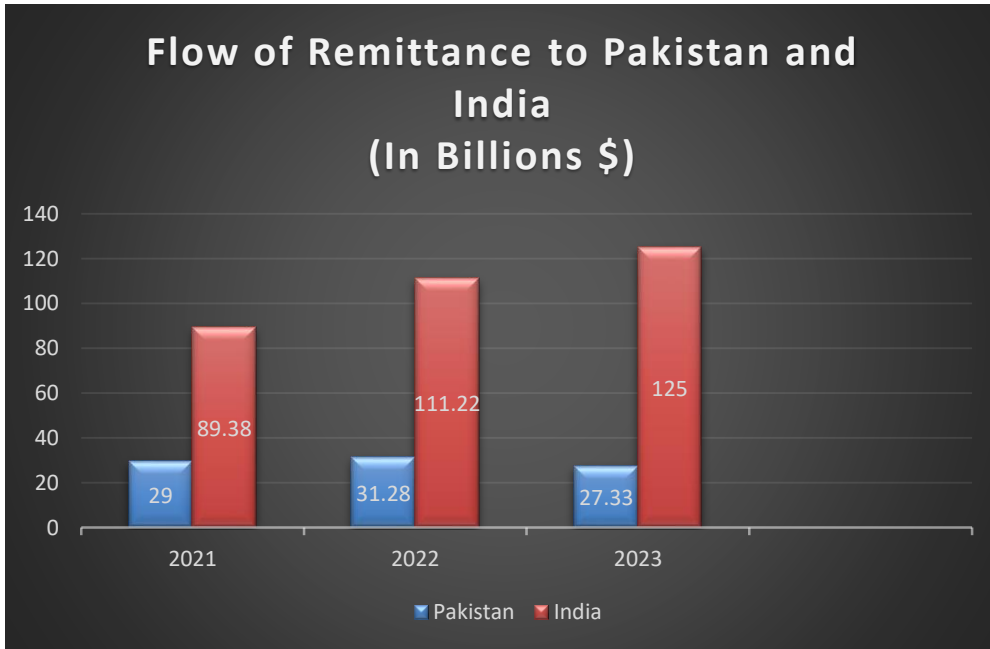
The table below shows the available data on the number of unskilled migrants to GCC from Pakistan and India, taken from the reports of manpower exports available on the official website of BE&OE. For India, the data for ECR (Emigrant Clearance Required) emigrants were available.

Years	Pakistan	India
2019	224633	353126
2020	86253	90602
2021	103130	N/A*
2022	324995	
2023	353388	

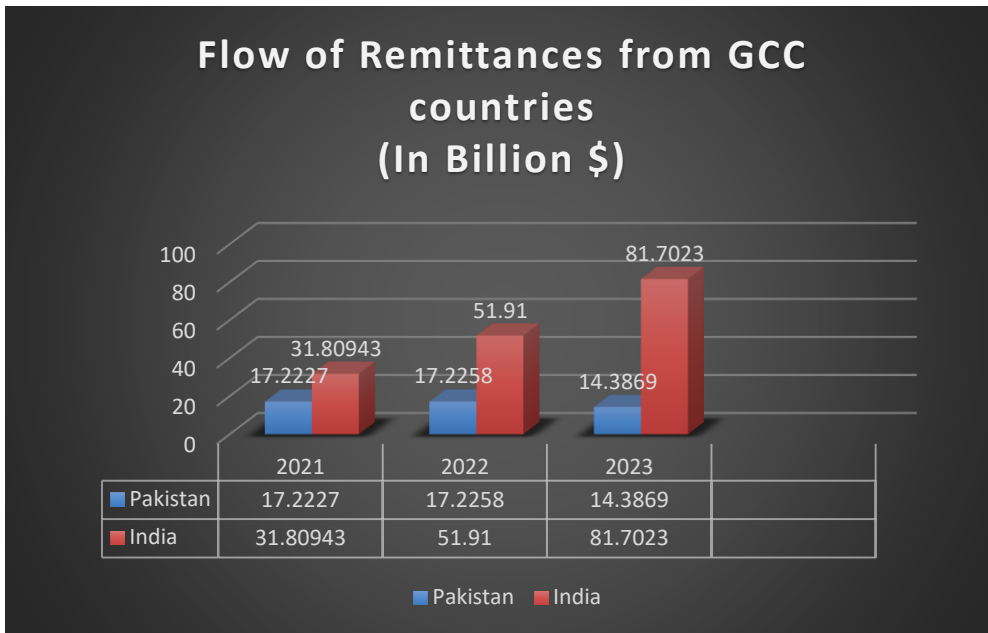
Sources: BE&OE, (2024)

* The data for India is taken from the official website i.e. www.emigrate.gov.in, for two years i.e. 2019 & 2020, whereas the data for onward years is not accessible.

Remittance flow to Pakistan and India

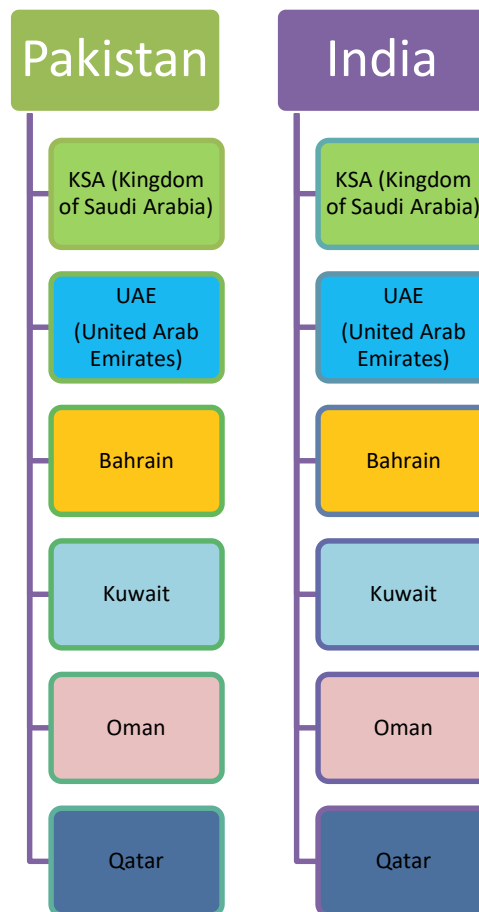


Source: (SBP, 2024) and (World Bank, 2024, Forbes, 2024)



Source: (SBP, 2024) and (World Bank, 2024, Forbes, 2024)

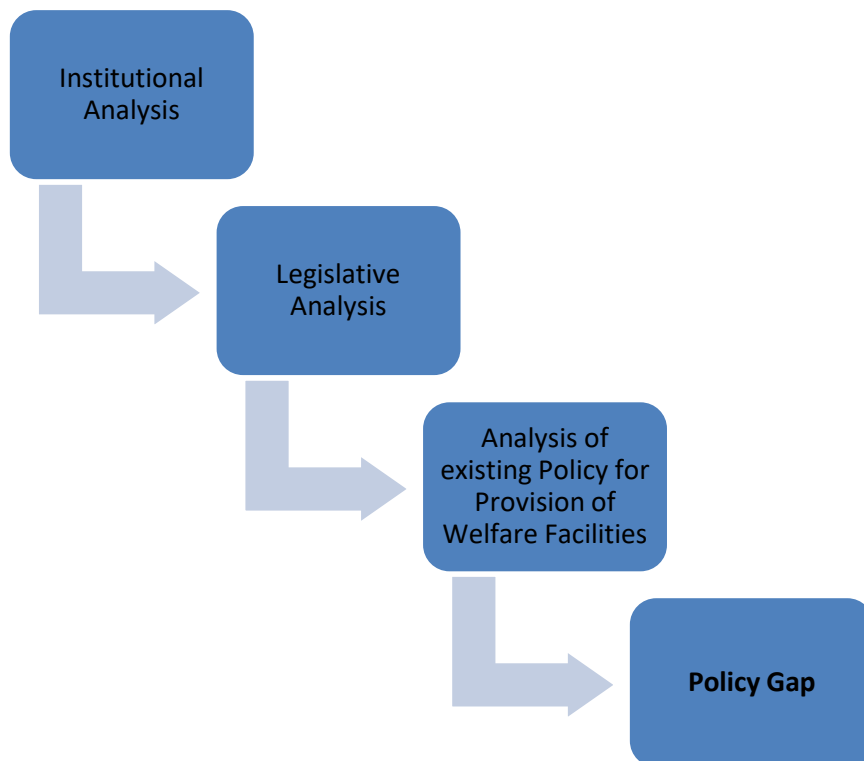
Agreement/MoUs of Pakistan and India for Manpower Export with GCC:



A significant development occurred with the recent bilateral agreement between India and the UAE. The agreement, signed in February 2023, aimed to establish a framework promoting the use of local currencies for cross-border transactions and fostering cooperation in interlinking payment and messaging systems. This strategic move is expected to play a crucial role in enhancing the formalization of remittance flows to India. The agreement facilitates a more structured and secure channel for remittances, aligning with efforts to promote financial integrity and reliability in cross-border transactions (Business Standard, 2024).

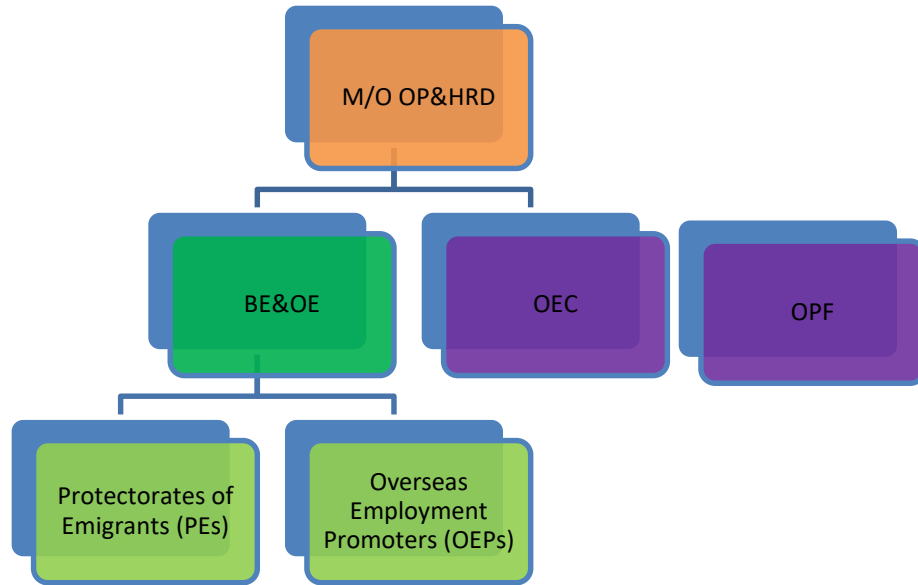
Legal Framework

The paper studies the existing institutional, legislative, and welfare programs of Pakistan and India for unskilled labor migrating to GCC nations as the most prominent and effective way of examining unskilled labor migration issues in the Gulf States and speculates on the policy gap. These analytical methods help identify institutional structures, the legal atmosphere, and mechanisms that impact the policies concerning unskilled migrants in the GCC states (Aarthi et al., 2021). Other analytical methods demonstrated in the paper for conducting a robust policy analysis include policy analysis regarding the provision of welfare services to migrants working in GCC nations.



Institutional Analysis:

Labor emigration along with their welfare in Pakistan is managed by three key agencies under the M/O OP&HRD. Of the three, the Bureau of Emigration and Overseas Pakistanis (BE&OE) is the central authority. The Overseas Pakistani Foundation (OPF) and the Overseas Employment Corporation (OEC) play lesser but equally important roles in the return and reintegration of migrant workers, workers' welfare, and the promotion of overseas opportunities, respectively.

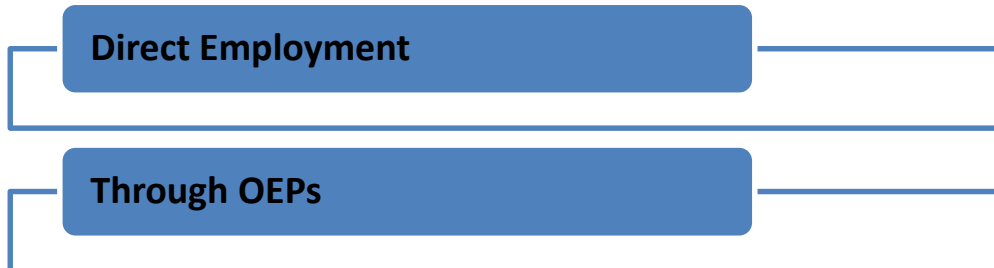


Bureau of Emigration and Overseas Employment (BE&OE):

BE&OE is an attached department of the Ministry of Overseas Pakistanis and Human Resource Development (MOP&HRD) and is currently the custodian of the Emigration Ordinance (1979) and Emigration Rules (1979), which provide the key legal framework for safeguarding the rights of overseas workers and regulating the activities of private and public overseas employment promoters (OEPs). The Emigration Ordinance provides guidelines for licensing and regulating OEPs, protecting workers against malpractices, and redressing grievances of workers against employment promoters and employers (or vice versa). The enforcement of the Ordinance is managed by BE&OE through its nine (09) Protectorate of Emigrants Offices (PEs) and the Community Welfare Attachés (CWAs) in the countries of destination.

Modes of migration from Pakistan:

There are two types of modes: one is called Direct Employment, in which the person has arranged their visa through the efforts of family/friends, etc., and the other mode is called Through OEP, in which the registered agency/OEP has arranged the visa for the emigrant.

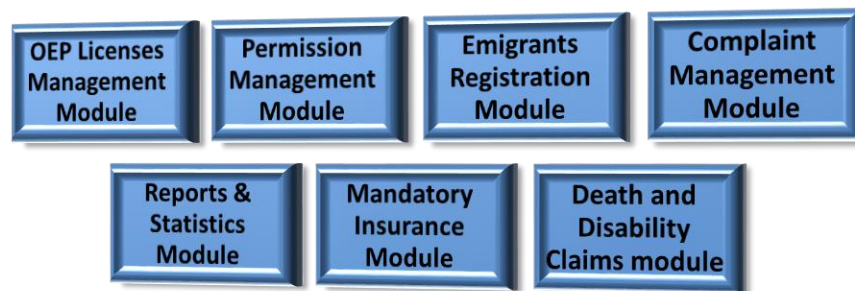


Initiative of e-Protector:

BE&OE has currently started the e-Protector facility for all direct intending emigrants, allowing them to obtain their protector clearance certificate online without physically visiting the concerned Protector of Emigrants office.

Introduction of BEOE-MIS:

The Bureau of Emigration and Overseas Employment (BE&OE) implemented a project titled "Registration of Intending Emigrants via Biometric Verification System linked with NADRA" in all Protectorate of Emigrants offices to ensure the highest level of efficiency and improvement in service delivery, with various automation modules including:



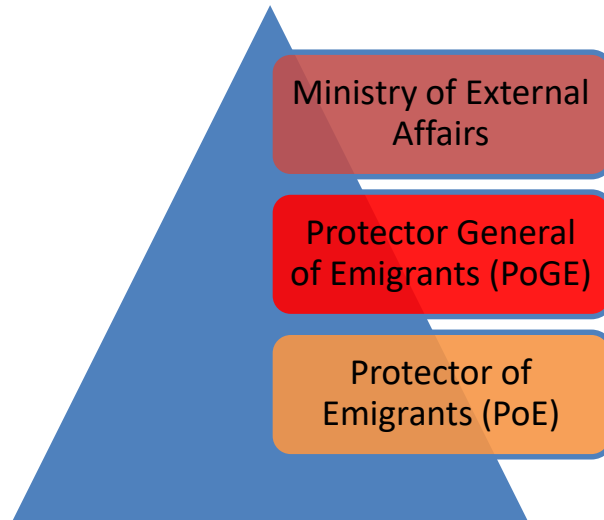
Community Welfare Attaches (CWAs) Offices

The Government of Pakistan has appointed 21 Community Welfare Attachés (CWAs) in 15 different countries, including 09 in GCC, under Section 7 of the Emigration Ordinance, 1979. These CWAs perform their duties under Rule 30

of the Emigration Rules, 1979, to safeguard the interests of migrant workers working/residing in Countries of Destination (COD).

Institutional framework for labor migration in India:

The institutional framework that governs the migration process from India is represented below:



Overseas Employment & Protector General of Emigrants (OE & PGE) Division

The process of emigration for Indian workers holding Emigration Clearance Required (ECR) category passports is regulated under the Emigration Act, 1983, which is administered by the Ministry of External Affairs (MEA) through the Overseas Employment (OE) and Protector General of Emigrants (PGE) Division. Under Chapter III, Section 10 of the Emigration Act, 1983, no person or agency may function as a Recruiting Agent without a valid certificate issued by the registering authority. The Joint Secretary (OE) & PGE is the registering authority and is responsible for enforcing the Act with the help of 14 offices of the Protector of Emigrants (POEs). Some of the initiatives undertaken by the Indian government are presented below:



***GCC-Specific Initiatives to Protect Indian Migrants:
Pravasi Bharatiya Bima Yojana (PBBY):***

Pravasi Bharatiya Bima Yojana (PBBY) is a mandatory insurance scheme for the welfare of overseas workers in ECR countries. It provides insurance cover of up to Rs. 10 lakhs in cases of work-related death or permanent disability. Insurance is available with a one-time premium of Rs. 275 and Rs. 375 for two and three years, respectively.

Mahatma Gandhi Pravasi Suraksha Yojana (MGPSY)

The Mahatma Gandhi Pravasi Suraksha Yojana (MGPSY) is a specially designed social security scheme for unskilled and semi-skilled Overseas Indian workers with ECR passports, working in ECR countries. It encourages and enables overseas Indian workers to make co-contributions to: (a) save for their return and resettlement in India, (b) save for a pension, and (c) obtain complimentary life insurance cover during the period of overseas employment.

Indian Community Welfare Fund (ICWF):

The Indian Community Welfare Fund is aimed at assisting Overseas Indian nationals in distress on a 'means-tested' basis. It was set up in all Indian missions and posts abroad and has over 80,000 beneficiaries. This fund enables Indian missions/posts to meet contingency expenditure for specific

activities, including air passage for stranded Indians, boarding and lodging, initial legal assistance, emergency medical support, and airlifting of mortal remains.

Open House Sessions by Indian Missions/Posts

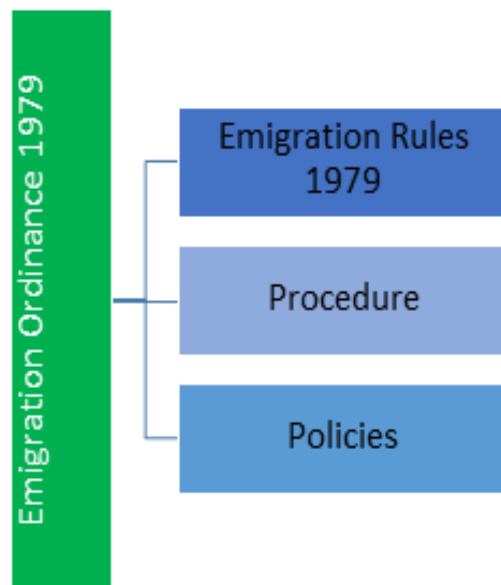
Indian missions/posts abroad hold Open House sessions at specific times. Any Indian citizen can walk in and interact with the officers at the mission/post without an appointment and submit complaints or grievances.

Emigration of Women for Employment in ECR Countries

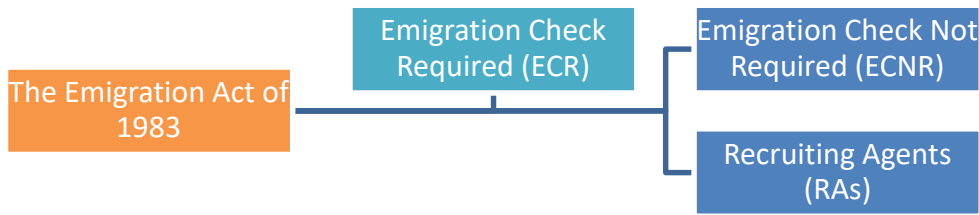
The government of India has fixed the minimum age of ECR category female workers proceeding for overseas employment to 30 years and requires them to emigrate only through state-run recruitment agencies. Foreign employers directly recruiting Domestic Service Workers (DSW) must deposit a security of \$2,500 in the form of a bank guarantee with the Indian mission.

Legislative Analysis

The legislative landscape underpinning unskilled migration in GCC nations, with a comparative study focusing on Pakistan and India, presents a multifaceted system consisting of laws, regulations, and agreements among different parties that significantly influence the movement of migrant workers.



Legislative bodies governed the Emigration Process from India



Pakistan and India are endowed with specialized institutions, such as the Bureau of Emigration and Overseas Employment (BE&OE) and the Indian Ministry of External Affairs (MoEA), which handle migration matters and ensure that home laws are properly observed (Ewers et al., 2022). Scrutinizing the bilateral agreements and MoUs (Memoranda of Understanding) between sending and receiving countries is another legislative analysis action that these institutions need to carry out to ascertain the inclusion of aspects related to labor exchange, recruitment, etc., as well as migrant workers’ well-being (Ahmad & Rahman, 2024).

Gap Analysis

The paper analyzed the comparison of the flow of unskilled workers and remittances to Pakistan and India from GCC nations. The study also compared the agreements/MoUs signed by Pakistan and India for the export of manpower with GCC countries. Finally, based on institutional and legislative analysis, a way forward is speculated with the policy for providing welfare services to the unskilled workers of Pakistan and India in GCC countries.

Existing Policy	Desired Policy	Gap to address
Existing emigration legal framework of Pakistan is confined to the intending emigrants only	Steps to cover the reintegration aspect of returnee emigrants.	Scope of BE&OE needs to expand by introducing reintegration of returnee emigrants.
Emigration domain is divided among different government institutions like BE&OE, OPF, TEVTA and FIA	Emigration domain to single government entity	To integrate the emigration domain by empowering BE&OE with enforcement of emigration legal framework, welfare of emigrants and the responsibility of training

		of the intending emigrants.
No support from CWAs in Country of Destination (CoDs) in litigation matters and other welfares related issues.	Accountability of CWAs for the provision of assistance to Pakistani manpower in issues faced by them in CoDs.	Develop a mechanism to resolve issues of Pakistani manpower in CoDs with full time assistance of CWAs.
Lack of skill training by Pakistanis Manpower	Enhance skill of intending emigrants as per market demand, highlights the jobs in demands by the CWAs, and accreditation of skill certification.	Strengthen the skill training programs Perform the responsibility of CWAs to report the jobs as per market availability Enhance cooperation between relevant institutions in CoDs and Pakistan for accreditation of skill certifications.
Current legal framework is general and no GCC specific policies/legislations	Need to design GCC specific policies to facilitate above 90% unskilled labors.	Strengthen the existing legal/institutional framework with GCC specific policies

Issues & Challenges

Considering the comparative policy analysis of the existing institutional and legislative frameworks of Pakistan and India regarding unskilled worker migration to the GCC, the following are the issues and challenges:

Pre-Departure

- **High Recruitment Costs:** Workers are often burdened by debt to recruitment agents.

- **Lack of Skills Training:** Workers may not possess the specific skills demanded in GCC countries.
- **Limited Information:** Workers may be unaware of working conditions and legal rights.

During Employment:

- **Exploitative Contracts:** Workers face long working hours, low wages, and poor living conditions.
- **Non-Payment of Wages:** This is a common issue, and it is difficult to pursue legal recourse.
- **Physical and Verbal Abuse:** Such abuse can occur in some workplaces.
- **Limited Access to Healthcare:** Workers may not have proper health insurance coverage.
- **Restricted Movement:** Workers may have difficulty changing jobs or leaving the country due to the sponsorship/Kafala system.
- **No Support from CWAs:** Unskilled workers in the Gulf often experience a lack of support from the CWAs due to reasons including limited human resources and a larger diaspora in GCC nations.
- **Posting of Unacquainted Officers in the CWA:** The existing policy for posting officers as CWAs includes individuals from various cadres who lack prior knowledge of the challenges faced by the diaspora, the Emigration Ordinance, and related rules, as well as technical knowledge of emigration promotion.

Post-Employment:

- **Job Insecurity:** Workers are vulnerable to layoffs and contract terminations.
- **Difficulties Returning Home:** Workers face financial struggles and social reintegration challenges, as the Government of Pakistan and the custodian of the emigration process do not have welfare schemes in practice for returnees.

Conclusion

From the above discussion, it is concluded that no country has an exclusive policy regarding migration to the Gulf. However, specific elements in Indian policies for facilitating and protecting migrants in the Gulf are included in various government policies and programs intended to promote and protect Indian migration in ECR countries. In contrast, there are no specific policies or programs for unskilled workers in GCC nations within Pakistan's existing policies, despite having 96% of its migrant diaspora in the GCC, with a majority of over 85% in the UAE and KSA.

Both countries have MoUs with all GCC nations for the export of manpower, but India has the advantage of additional protocols regarding emigrants'

protection, social security, and other welfare aspects. Furthermore, India benefits from accreditation bodies for GCC skills certification, whereas Pakistan has no such program.

Both Pakistan and India have similar patterns of legislation and institutional frameworks regarding migration and no specific protocols for unskilled workers in GCC nations. However, India has the advantage of a strong institution for enforcing existing legislation and has empowered local police/administration at lower levels to combat illegal migration. In contrast, migration falls under the jurisdiction of the Federal Investigation Agency of Pakistan, with no role at the provincial level.

The Indian government provides support services at all stages of emigration—pre-departure, at the destination, and upon return—while Pakistan's institutional framework in this regard fails to provide full support, especially at the destination and in the case of returnees. In the case of female domestic workers, the Indian government has policies to protect their rights, including security from the employer. On the other hand, Pakistani female workers often face exploitation in the GCC.

Likewise, there are several salient characteristics of emigration from India to the Gulf countries in terms of occupational, skill, gender profile, and source-and destination-wise distribution within India and the Gulf region. These characteristics provide a larger context within which the associated benefits and problems, as well as the labor and migration policies on both sides, can be assessed.

Recommendations

Short, Medium, & Long Terms with an Action Plan

Following are the short-term and long-term recommendations with policy actions to address identified gaps in Pakistan's emigration process:

Short-Term Recommendations:

- **Enforce and Amend Existing Legislation:** Immediate action is required to update and strictly enforce current policies and regulations governing emigration from Pakistan to GCC countries. This involves incorporating insights from research institutions to enhance the protection of migrant workers.
- **Prioritize Skill Certification and Combat Fraudulent Certification:** The government needs to emphasize the promotion of accredited skill development programs for potential migrants to reduce the export of unskilled labor. Simultaneously, strict penalties should be imposed on agents/subagents involved in providing fake skill certifications.
- **Monitor and Evaluate the Existing Emigration Process:** Implement strong checks on the activities of Overseas Employment Promoters

(OEPs), skill certification institutions, and Trade and Training Centers (TTCs). Establish mechanisms for monitoring and evaluating policy implementation to ensure effectiveness in addressing the identified gaps.

- **Increase the Number of Community Welfare Attachés (CWAs) in GCC Nations:** Given the significant number of Pakistani migrants employed in GCC nations, prioritize increasing the number of CWAs in these countries to safeguard the interests of Pakistani workers.
- **Close the Wage Gap for Pakistani Unskilled Manpower in GCC Nations:** Address disparities in wages to improve the economic situation of Pakistani workers in GCC countries.

Long-Term Recommendations:

- **Extend Existing Labor Agreements for the Export of Manpower:** Negotiate comprehensive agreements with host countries in the GCC to improve working conditions and living standards for Pakistani migrants. These agreements should align with the United Nations' Sustainable Development Goals (SDGs) to ensure sustainable and equitable outcomes.
- **Establish Accredited Skill Development Institutions in Pakistan:** Set up a system to accredit skill development institutions for migrants, mirroring the practice in India. This ensures the quality and relevance of training programs to meet market demands.
- **Enhance Skills of Pakistani Labor:** Develop policies aimed at improving the skill levels of Pakistani laborers to enable them to compete effectively with their counterparts. This could involve targeted investments in education and vocational training programs.
- **Modify the Functional Division of Emigration Processes:** Consolidate the current functional division of the emigration process under the Bureau of Emigration & Overseas Employment (BE&OE) exclusively. This adjustment aims to streamline oversight and enforcement, avoiding confusion and improving efficiency compared to the current fragmented approach involving multiple agencies.
- **Collaborate with GCC Nations through International Organizations:** Engage with international organizations such as the UN, ILO, MRCs, and ICMPD to effectively address the challenges faced by unskilled workers in the region. Active participation in regional forums and engagement with global entities provide vital resources, including financial aid, skill enhancement, and training, strengthening enforcement capabilities and promoting best practices in emigration. Regional forums serve as crucial platforms for skill enhancement and knowledge sharing, optimizing the benefits for labor and addressing shortcomings in the emigration process.

Proposed Policy Framework

A suggested policy framework for addressing the shortcomings in the emigration process from Pakistan could include several key components:

- **Regulatory Framework Strengthening:** Implement robust regulations and laws to govern emigration, ensuring compliance with international standards and safeguarding the rights of migrant workers.
- **Pre-Departure Preparation:** Establish comprehensive pre-departure orientation programs to educate potential migrants about their rights, obligations, destination country laws, and available support services.
- **Skills Enhancement and Certification:** Facilitate skill development programs and certification for potential emigrants to enhance their employability and ensure compatibility with destination country requirements.
- **Transparency and Accountability:** Institute transparent processes for recruitment, visa issuance, and employment contracts, with mechanisms for monitoring and accountability to prevent exploitation and abuse.
- **Worker Welfare Mechanisms:** Establish support mechanisms such as helplines, legal aid, and counseling services to assist migrant workers in distress and address grievances promptly.
- **Bilateral Agreements and Diplomacy:** Strengthen diplomatic ties and negotiate bilateral agreements with destination countries to protect the rights of Pakistani workers and facilitate their integration into host societies.
- **Data Management and Information Sharing:** Develop robust systems for data management and information sharing among relevant stakeholders to track migration flows, address emerging challenges, and facilitate evidence-based policymaking.
- **Reintegration and Return Support:** Provide reintegration assistance and support services for returning migrants to help them reintegrate into their communities, access livelihood opportunities, and contribute to local development.
- **Public Awareness and Education:** Conduct public awareness campaigns to inform potential migrants about the risks and opportunities associated with emigration, emphasizing legal channels and safe migration practices.
- **Capacity Building and Institutional Strengthening:** Invest in capacity-building initiatives for government agencies, civil society organizations, and other stakeholders involved in the emigration process to enhance their effectiveness and efficiency.

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